The Craft Edition

Rogers, Jon

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

The CRAFT *edition*

FROM GOA 2017

A Publication by UnBox in partnership with Mozilla's Open IoT Studio

Published by Visual Research Centre,
Duncan of Jordanstone College of Art and Design, University of Dundee.

ISBN: 978_1_899837_76_0

The CRAFT edition

FROM GOA 2017

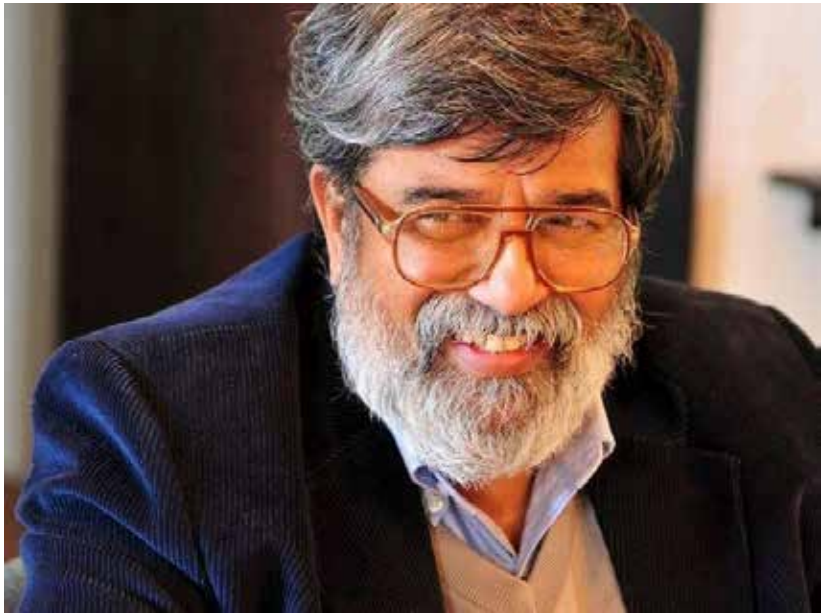
A Publication by UnBox in partnership with Mozilla's Open IoT Studio

Editing - Babitha George, Jon Rogers, Michelle Thorne and Romit Raj

Design- Sukanya Deepak, Nia Thandapani

contents

We would like to dedicate this book to late Prof. M P Ranjan.



Courtesy Sudhir Sharma

With 40 years of experience in design education and practice, Prof MP Ranjan was one of the first people to prepare an encyclopedia on Indian crafts. His course 'Design Concepts and Concerns' has become a hallmark for the National Institute of Design, Ahmedabad and is still offered to students as part of the foundation training. Ranjan, one of the strongest pillars of NID who pioneered research work in bamboo, passed away in August 2015.

He has provided amazing inspiration and support for UnBox over the years, and a lot of our focus on the complex, emergent nature of design process emerged from the inspiration and knowledge that he shared with us. We wanted to dedicate this book to Ranjan; the questions he posed and the knowledge he shared with us generously over the years have guided several of our explorations with the Caravan.

I was never lucky enough to be taught by MP Ranjan. But each conversation I had with him over the years had enough intellectual depth combined with deep curiosity and empathy that was the equivalent of several classes. He encouraged us to think beyond the obvious, and look at the larger system at play, while also thinking about interconnectedness and unexpected implications of design decisions. All of this, with a whole lot of generosity and warmth. Pretty much every conversation I have had with Ranjan, was accompanied by a list of recommended readings and one of his famous selfies. In one of his essays for 'What Design Can Do' on the benefits of design for India and for society, he wrote: "Design is like a potent seed that can grow if it is nurtured by society and through collaborative processes can produce huge change in the world." And this has been a guiding thought for our work through the Caravan.

Babitha George

It was August 2009. The rain was pouring into the courtyard of the "Big Tree" on my first visit to NID. "Come in come in", beamed a grinning friendly bearded face. "I'm Ranjan. You must be Jon. Let me take a selfie." The beard and smile only just matched in scale by the stacks and stacks of books and publications. Books that he had were like a plant enthusiast would have in a greenhouse - where piles of cuttings, reprints, newspapers, magazines, hardbacks, softbacks and catalogues grew in a system known to one man. That man was MP Ranjan. A man whose warmth, intellect and generosity of spirit reaches out on an almost daily basis despite having left this earth two years ago. His deep knowledge of craft, the economy, design, culture, politics and technology enabled him to make the kind of intellectual leaps we could dream of. His effortless complex arguments about the importance and power of design to benefit ordinary people were jaw dropping to witness. That Big Tree grows still. A tree that grew from a sapling to a giant tree outside Ranjan's office in the length of his career is a powerful metaphor for how the institution, it's people and those like me lucky enough to have passed through have also grown from his intellect and wisdom.

Jon Rogers

The amazing thing about Ranjan is that he lives on in the thoughts and lives of so many people. He certainly does for me. In our many conversations together, he always renewed my confidence in the capacity of Indian design to be a moral as well as creative inspiration for the world. He had a unique gift for connecting the latest developments with timeless cultural truths. His way of being in the world - looking ahead, whilst also looking back - is his living and enduring legacy.

John Thackara

I spent 13 years with Prof MP Ranjan at NID, where he was my colleague, mentor and well wisher. I assisted and worked with him on many projects, and shared many interests and ideas. At NID we always spent late evenings with him.

MP Ranjan was one of the greatest design gurus India has ever produced. He was a mentor, provocateur par excellence, and always created learning opportunities for others. With his unique world view of design, he always radiated positive energy.

He was always sharing his wisdom with everyone he came across, inspiring them in many ways. He was a doer and thinker. All his life he practiced, taught, documented, published, shared and left all the wisdom for all of us to cheer, relish and build on.

He pushed students, and his colleagues to think beyond the usual. He would always listen and share stories of interesting things happening around the world and help make connections. No conversation or interaction with him left you unprovoked.

Even after he is gone we still live with him and remember him every day and his legacy will take us a long way.

Praveen Nahar

Courtesy Sandeep Raj

INTRODUCTION

The Caravan comes to Goa

Babitha George

The UnBox Caravan- Goa edition was one of the many convenings hosted by the Open IoT Studio. We began the first in the series with the Caravan hosted by UnBox at the National Institute of Design, Ahmedabad. The intent of all these events has been to bring together a group of interesting and interested people to explore our collective technology futures through multicultural and interdisciplinary lenses. Over the past few gatherings, there has also been a more specific focus on the Internet of Things.

In March 2017, we brought together a smaller set of partners at the Quicksand studio in Goa, in a format that was more open than usual, to explore and think together about some of the themes we had been exploring independently in our own streams of work. Craft, decentralized practices and the politics of production are not themes that 'naturally' align with the Internet of Things. However as a group, all of us had been exploring these very themes (directly or indirectly with technology) and wanted to come together to see how our learnings and the challenges that we were grappling could be further built on with the larger group.

What has been amazing about these convenings and what excites us as hosts, are the values that these groups come together with. We have always maintained that for true collaboration and learning to happen, we need to embrace ambiguity and be able to trust each other, in order to be able to present thoughts (often half-formed) with openness and vulnerability. Too often, we are stuck in situations that are symbolic of a different ethos- one of absolute certainty, and of overt structure. While there is merit in action-packed fast-paced events in being able to see a lot of new things and people, we have always felt that there is a real need for slower events that allow people to be themselves and engage deeply with others and the space that they are in. What we have been exploring in the past seven years with various manifests of UnBox have been imaginative expressions that are free and attempt to mash together various paradigms. The Caravan series has been a true representation of these values, with some serendipity thrown in; however this serendipity has always had enabling structures via a base level of trust and openness that the participants come with. And it is in the curation of such a group that a lot of our success lies. A constructivist experience that bases itself on time for conversations and open explorations, can fail dramatically if the participants in that experience are not open to this serendipity.

These sorts of group endeavours are also harder on everyone since the nature of evaluation and the levels of experience and competence are themselves subject to discipline-specific attitudes and practices. It is maybe easier to participate in a more

structured format, where you just need to do what you are told and bring what you are 'supposed' to bring. What happens when we break down this structure, when we slow things down, when we pause, observe and listen intently, when we debate earnestly but with the knowledge that the other is there to help build our thoughts and not solely to break them down. And when we truly relate to each other as friends and partners who we can learn from and engage deeply with.

It is hard to write about the intent and conclusions of inherently open-ended processes that are exploratory in spirit, scope, manifestation and failure. This book is an attempt to put together our explorations in the time that we spent together, as well as some of the explorations that all of us were carrying out prior to meeting and are continuing to explore. Some of the pieces within it are more resolved, some not so. We have edited these very lightly in order to keep the inherent chaos and uncertainty that these writings are often attempting to articulate. I would urge you to see these as open pieces that invite further debate and participation.

The journey that we have had with the Caravan over the past year and a half would not have been possible without the incredible partners that we have in Jon & Michelle and the Mozilla Foundation's Open IoT studio. It is not often that we find partners who are willing to support open formats and explorations, especially when we don't know what will come out at the other end. And the journey has been incredibly fulfilling for all of us. I want to also thank the amazing participants we had this year - Jon, Justin, Jayne, Davide, Vladan and Romit (and Michelle from afar), who were willing champions in the suspension of disbelief and in embracing this exploratory format that we have been trying to foster. And a special thank you to the larger network of UnBox friends, especially Andrew Prescott, John Thackara, Vishwanath aka Zen Rainman and the whole UnBox/Quicksand crew to contributing to our thinking and explorations via conversations, guidance, provocations and writing.

If we want to study and explore complex human systems as inspiration for future social and cultural imaginations, it can only be through co-owned processes that everyone is in charge of, simultaneously leading and participating in. And over the few iterations of such events that we have hosted and been a part of, I am increasingly convinced that this has to be the way of the future for us, if we want to initiate and engage in truly interdisciplinary work, that is also thoughtful and deliberate.

People at the Caravan

Babitha George and **Romit Raj** are researchers and writers at Quicksand, an interdisciplinary consultancy that facilitates meaningful experiences through design research and innovation. The studio also curates the UnBox Festival.

Davide Gomba is Managing Director of Officine Innesto in Turin. He is a storyteller, maker, and an old-time Arduino enthusiast. He is part of the original team that set up the open source house Casa Jasmina, which he is an integral part of.

Jayne Wallace is a design researcher and professor at Northumbria University. She explores digital jewellery and the act of making to support sense of self. She focuses on how contemporary craft and the digital can support living with dementia and bereavement.

Jon Rogers holds a personal chair in creative technology at the University of Dundee and is a Senior Fellow with Mozilla's Open IoT Studio. His work explores the human intersection between digital technologies and the design of physical of things.

Justin Marshall is an associate professor at Northumbria University. He is a practice based researcher focusing on the role and value of craft in interdisciplinary digitally orientated research projects, as such he is interested in both digital craft and crafting the digital.

Vladan Joler directs the Share Foundation and works as professor at the New Media department at University of Novi Sad. He investigates invisible aspects of technology and recently researched Facebook's algorithms.

Companions on our journey:

Michelle Thorne leads the Mozilla Open IoT Studio, a research network for practitioners investigating and advocating for a healthier Internet of Things. She previously directed Mozilla's web literacy programs and produced the Mozilla Festival.

Andrew Prescott is a professor at the University of Glasgow. He formerly curated the Department of Manuscripts at the British Library, where he acted as the British Library coordinator for a number of digital projects, including most notably Electronic Beowulf.

John Thackara is a writer and thinker, who has traveled the world in his search of stories about the practical steps taken by communities to realize a sustainable future. He curated the Doors of Perception conference for twenty years, and he once drove a London bus (routes 73 and 134).

What are these books for?

Jon Rogers

A few days after returning to Berlin from the Craft Caravan in India, I was walking home from work with Michelle, my fellow program lead at the Mozilla's Open IoT Studio, and Brett Gaylor, the documentary filmmaker and all-round Mozilla advocacy champion. Wegbier in hand (German for "beer for the road"), the conversation came around to what we were doing in India and how we were telling the story of the event. Michelle and I told Brett about the informal publications we made in 2016 and how they fed into our end-of-year report, Practices for a Healthy Internet of Things.

"Are these books like the ethnographies of the events?" asked Brett.

A good question. And one that I've been thinking about a lot. The books aren't directly ethnographic. They are more collective reflections and field notes. They happen to contain ethnographic elements, but in many ways, these publications are a "reflective journal" for the event participants.

What is a reflective journal? The University of Sheffield's Student Skills and Development Centre provides this explanation:

Learning isn't just about learning stuff, or learning how to do stuff; it's also about learning about how you learn, and how you can help yourself learn better. Reflective journals are sometimes used to help you look back on what you've learnt, and consider how you've learnt it. This can make the experience richer, and make you more self-aware. As a twist on a common phrase might put it, 'Don't just do something: stand there and think about it!

It's always difficult to document the activity of a group. People have their own experiences, journeys, and memories of the event. When we did the first Caravan book in January 2016, our intention was to collect a group narrative so that we could tell people what we were doing. Looking back, that publication and subsequent ones from events are like field notes and shared reflections from the group. Together they form a reflective journal comprised of many voices.

I wonder if we could use these journals to better guide a group to look back on what they've learnt, and consider how they've learnt it.

Michelle and I definitely used these publications this way. They helped us focus the IoT Studio's activities and tell our story crisply. Our current theme on craft sprouted from the books from the first Caravan, the Anstruther event and the V&A book.

So what are these books for? I think they're what you read them to be. But I would ask you to see them both as a lens on the work we're doing as well as a mirror to reflect back to us and help us better consider our activities and help enrich the work we do.

We invite you to read this book with the mindset recommended by our dear collaborator, Jayne Wallace:

This writing is not just reflection, but it is also the act of realisation through writing things down. It is writing to tease things apart and tease out clarity of thought—through collective discussion. It is writing to test if what you think you are saying is understood by the others in the group. To see if you're making sense to more than yourself. And to gain critique from the group in order to clarify.

Why Craft for Decentralized IoT

Michelle Thorne

The way much of digital technology is made today is highly centralized: software is developed in Silicon Valley and the hardware is produced in Shenzhen. There are other pockets of code and manufacture in Japan, Korea, and India, but chances are, your IoT devices were programmed in California and built in China.

Why does this matter? For one, there's always an inherent risk when production relies on a single site. What happens if there is a natural disaster or political turmoil, and California shuts down? With severe centralization, there is a danger of having these single points of failure. It would be hard to recreate the digital services headquartered in Silicon Valley. But goodness knows, people are trying.

Another argument why centralization is not ideal- it means that innovation tends to serve the markets that these regions are familiar with. There's a reason why so many apps coming out of Silicon Valley are designed for the "problems" of white, privileged middle-class technologists. Those are the very people making these apps.

If you care about the democratic possibilities of technology, and the right for people to access the internet and use it in their language and on their terms, then centralization is problematic. The concerns of a minor language in the mountains of Spain, or of a fishing village in Scotland, or of migrant communities in the US south are not economically interesting to the big centralized companies. It's likely that voice recognition isn't going to work for those Scottish fishermen, or the ride-request app prices out the migrants looking for a lift.

That's why we see hope in decentralized innovation. What would foster more local communities creating digital technologies that respond to their needs and are controlled by them? This is a hard thing to do.

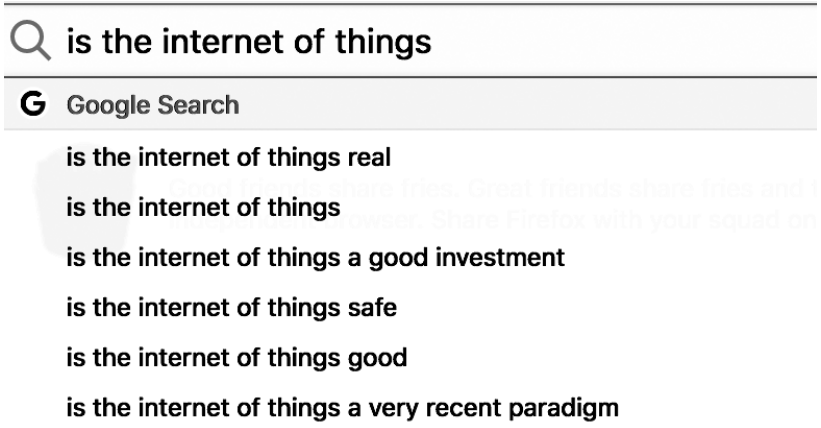
The craft approach, which we explore in this book, might guide us to a more sustainable, thoughtful and respectful approach to innovation among communities. Craft is a tool that's been part of humanity for millennia. It's about care for materials, for longevity, and for suitability of the object within the context of a specific person or group.

In an era where our technology moves at a reckless pace, it's important to explore approaches that slow things down. This is not an argument for putting the brakes on innovation and technological change. Instead, it's about putting responsibility on the makers of technology to address what is healthy for the environment, for the users and for the internet itself.

Why is working on the Internet of Things important?

Jon Rogers

What is the Internet of Things or IoT, how is it different from other forms of computing and what is the state of play right now? There's so many questions around IoT and so many are skewed by a very narrow band of people. I wanted to write something that reflected my experience of IoT that was set against the collective questioning of society. So rather than pose directions myself, I let Google do the work for me...



Google auto-complete of "Is the internet of things". Search made from Berlin in June 2017

Is IoT real, safe, secure, a good investment, a very recent paradigm? Yes. No. No. Depends on what you mean by investment, No.

Let's unpick each of these.

Is It Real?

Well, if you do a google image search of "Internet Of Things" we know it looks like a proposal. A proposal that consists of lots of nice big blue systems diagrams that very carefully tell us what the future of our homes, transport, agriculture, entertainment, cities and every aspect of our connected world will look like.

The big three tech trends forecasters, Gartner[1], Deloitte [2] and McKinsey [3] all say IoT is real and it's worth a lot of real cash. Billions of dollars. Interesting that it's always dollars. But I digress. Is IoT real? However until around six months ago I would have said that the IoT is real in so far as it is a prediction of being real. That the predictions are very real, but the product isn't. But that changed this christmas. It changed because of voice control. IoT has found its first proper foothold into our homes. Exact figures are hard to come by, but it's in the millions of devices. This though is the consumer facing window on the IoT that the tech trends forecasters want us to see. You could argue that these are self serving prophecies where the forecasters stand to gain by stimulating the consumption of things by the prediction of things. That if they had not predicted it, it might not have happened. A tautology that perhaps I should leave for another day.

What I want to talk about it the reality of the IoT on our culture. It's one thing for something to be real because it is in our homes. But it's another when the reality hits home in painful ways. This is where, for me, the interesting answers to "is it real" start to come into play. The murder case of the Arkansas resident James Andrew Bates [6] is a reality check for how IoT will play out in the future. He has been accused of murder. The US police requested Amazon release the data from his Amazon Alexa account. They refused. However the accused has now given permission for the police to use his data [7]. What's interesting is not just the use of

the voice data. It's the use of his 'smart' home devices in general. Much less detail is given, but surely the smoking gun of the case is the exceptional use of water between the hours of 1am and 3am that police were able to ascertain from his smart water meter?

It reads like a narrative from a CSI or Black Mirror episode. But it's not fiction. IoT is real. **But is it safe?**

Is the Internet of Things safe? (and the next Q: Is the Internet of Things Secure?)

Safety is contextual. The answer is complicated and contextual. There are increasing examples of the potential for insecure IoT to cause serious harm or even death, as was recently shown by researchers who proved that the ten leading brands of pacemaker could be hacked remotely to cause loss of life [8]. Driverless cars have similarly been shown to be able to be remotely controlled, the most recent example is from an ex-uber ex-NSA security expert who states - "Autonomous vehicles are at the apex of all the terrible things that can go wrong " [9].

These are currently theoretical problems. They've not become practical problems yet, problems that are being faced by other commercial IoT products. Children's toys have started to get a lot of attention from security leaks. Cloud Pets ("A message you can hug") sell an internet connected toy for enabling children to send each other voice messages through a soft toy. The Guardian revealed in February 2017 that it's database containing more than 800,000 children's messages , their emails and their passwords had been hacked [10] . Something that Cloud Pets continues to deny "Contrary to the claims being made by some articles and blog posts, the affected database contained no Cloud Pets recordings or messages" [11].

It's all too easy to say we should turn back the technological clock and/or move to the hills. But this isn't practical or possible. Instead we need to pursue the goal of responsible IoT that fosters a healthy internet.

All clear? Good. Er hold on, but if you read down two lines you'll see this further clarification:

"The exception would be accounts owned by a small minority of users who used very simple passwords, easily guessed passwords, or who may have re-used passwords that could have been stolen as part of a data breach from another application or website."

So they have been hacked, but it's all the users' fault. This sense that it is not their responsibility is echoed in Facebook's response to the posting of a video of the horrific murder of a seventy four year old man in the US by the murderer: "We need to do better" said Justin Osofsky, Facebook's VP of global operations. "We need to do better" is akin to the ubiquitous school report "must try harder"[11]. As if it's a trivial matter. There's an arrogance coming from Silicon Valley right now that's no different from cigarette companies denying responsibility for smoking and for gun companies denying gun crime. The blame lies somewhere, but not with them.

Perhaps it's the user's fault. My university (rightly) doesn't trust its staff to do the necessary security updates to protect its students from lost laptops and hacked systems. It makes sure they do it for us. That's the responsible approach of a responsible IT department. Can the same be said for tech companies that sell us insecure IoT that enables our children to connect? And it's not just about kids' toys. If you want to get really up close and personal then look no further than sex toys. So it seems that the IoT could be safe, if only people used it safely...and understood the complexities of global internet security protocols and how to routinely do the updates and security administration that needs to be done. We all need to become system administrators of our household items - can you be bothered with that? I know I can't.

Is the internet of things a good investment?

What does it mean to invest in something? The google search will reveal a long list of search responses that provide you with insights on whether IoT is a good financial investment. You'll be able to read about patents, about its expected value in 2020, about the top 5 companies to watch. But it's hard to find investment beyond financial. What about as a good thing for society? Is it good to have computation amplified and empowered in this way? Should we invest time in learning about this emerging technology? If so, how would we do this? I've never been very good with money, but I'm pretty sure that I'm good with people. It's people that I care about. So will IoT be a good investment? I think that we've got it wrong. Compare the work in this publication that Vladan Joler is doing to expose the real cost behind our digital products and services, to the work that Babitha, Romit and Selvan have uncovered with a village that is attempting to live a " Gandhian Dream".

Valdan exposes some truly awful effects that highlight the lack of responsibility of tech companies. Babitha discovers a village that built a sustainable business by asking the people of the village what it would take for them to stay and work there. That if you follow a Gandhian approach you will be building an investment in people. If you invest in only the financial elements the consequences of the investment for the majority of people are potentially dire. I think there needs to be a radical re-think in the way we view investment. We should be investing time in raising skill and understanding of the IoT in our cities before we launch the Smart City programmes; we should be investing in ways to incentivise the repair of IoT in a way akin to Sweden incentivising the repair of household items [13]; we should be investing in the skills to do this.

Is the Internet of Things a very recent paradigm.

Well that's a great question google bots! Not such great answers through... I've been talking about how it's not a new concept. Certainly science fiction authors have been exploring it for over a century. My first encounter with the notion of IoT was during my English literature classes of the 80s. We were given E.M Forster's short story "When the machine stops" and I was hooked! It remains a powerful prophecy of humankind's reliance on technologies - on the wonder it can produce but also the dangers of what happens when it stops. I recently closed all of my social media accounts [14] (for me that meant closing LinkedIn and Twitter) and created my own little version of "when the machine stops". Thankfully it was all rather undramatic!

"Cannot you see, cannot all you lecturers see, that it is we that are dying, and that down here the only thing that really lives in the Machine? We created the Machine, to do our will, but we cannot make it do our will now. It has robbed us of the sense of space and of the sense of touch, it has blurred every human relation and narrowed down love to a carnal act, it has paralyzed our bodies and our wills, and now it compels us to worship it. The Machine develops - but not on our lies. The Machine proceeds - but not to our goal. We only exist as the blood corpuscles that course through its arteries, and if it could work without us, it would let us die." E. M Forster, the Machine Stops.

It was the only science fiction that E M Forster wrote, yet it gives a haunting writer's viewpoint on the future we're potentially walking into. Historians will of course give much earlier examples. Tom Standage's The Victorian Internet [15] is a vivid new lens on old technologies and their remarkable similarity to today's tech. Later in this publication, our dear friend and digital humanities professor, Andrew Prescott, likens the building of medieval cathedrals to how we might want to re-look at IoT. So is it a very recent paradigm, absolutely not! Not even close.

CRAFTS & IoT

Craft for me is an antidote to mass industrialisation. It existed before industrialisation and I strongly believe it will continue past it. Tim Berners Lee's ambition and intention for the internet was not for it to become something that is owned and controlled by the few - that it wouldn't go the ways of an industrialised internet. A direction that sadly we seem to have travelled a very long path down. I think this should change. My long time working with Babitha has given me incredible insight into India's culture and history, particularly around the development of Gandhi's nonviolent Revolution, where he used craft as one of the key elements for overthrowing the brutal British regime. It feels that now with the way in which mass centralized digital tools from facebook, google and amazon are being harnessed by right-wing governments globally, we need an alternative digital narrative that places individual, crafted, products and ideas at the centre. In this section of our Caravan field notes, you will find a mix of essays that unpick the relevance of craft, that draws from history, from culture and from a sense of place from our time in Goa and Ahmedabad. It also contains sketches and thoughts of concepts that are yet to unfold. We start with Andrew Prescott's deep dive into the history of craft and open source seen through the informal architecture of medieval cathedrals. Craft after all has evolved its resilience by billions of people working with localised materials for thousands of years. We think there is a lot to learn from this approach.

Jon Rogers

A Medieval Crash

Andrew Prescott

Beauvais Cathedral in northern France was one of the most ambitious and highly decorated Gothic buildings of the middle ages. The vaulted roofs of the choir were over forty metres high, making it the highest vaulted cathedral in Europe. However, in 1284, only twelve years after its completion, the choir dramatically collapsed, apparently because some intermediate buttresses were not strong enough (Murray, 1989).

The choir at Beauvais was rebuilt with much stronger buttresses, but an attempt in the sixteenth century to crown the building with a 153 metre tower, which would have made the cathedral the tallest structure in the world, resulted in further disaster when the tower fell down. Beauvais Cathedral remains admired as a great achievement of Gothic architecture but it is also a reminder of the challenges confronted by medieval architects. These challenges and their solutions give us insights into what a craft approach might look like for the Internet of Things.
Medieval architects and masons had limited engineering and mathematical knowledge and used simple instruments. The enormous scale of medieval cathedrals was achieved by the repetition of simple geometric forms using such basic tools as a 45° square and dividers. The pattern of the ribs and shafts in vaults might for example have been calculated by simple rotation of a 45° square (Shelby 1972). The size of the buttresses were calculated by rules such as that given the fifteenth-century German master mason Lorenz Lechler:

> *Divide the space between the buttresses into five equal parts: give three parts to the window, and two parts to the wall on either side of the window*
>
> *(Shelby and Mark, 1979).*

Medieval cathedrals are triumphs of pragmatic craftsmanship. They show how imposing and inspiring buildings can be created using simple tools, basic geometrical patterns, repetition and a 'rule of thumb' method. Sometimes as at Beauvais there were disasters, but generally this craft approach was very successful and resulted in some of the greatest buildings in the world.

The triumphs of the medieval stonemasons may seem a very long way from the modern digital world. But in every computer system there are surprising parallels

between computer software and medieval cathedrals. Just as cathedrals were created from the linking together and repetition of certain basic geometrical patterns, so computer programmes are derived from certain basic elements: arrays, strings, variables, conditionals, loops, etc. The variable and the loop are as simple and as powerful as the 45° square and the dividers were in the hands of the medieval mason.

Medieval masons relied on repeating simple geometrical concepts, and likewise, as Eric Raymond has pointed out,

> *A programmer could easily hold the entire logical structure of C in his head (unlike most other languages before or since) rather than needing to refer constantly to manuals; and Unix was structured as a flexible toolkit of simple programs designed to combine with each other in useful ways*
>
> *(Raymond, 2001).*

The way in which computer programmes consist of many different modules likewise resembles the organic way in which cathedrals gradually grew and developed. Just as a cathedral might have a thirteenth-century choir and a sixteenth-century tower, so a large programme might contain one component which dates back thirty or forty years, cheek by jowl with a more recent piece of coding.

The Credit Suisse global banking system dates back to the 1970s, and contains over 100 million lines of code written mainly in Java, C#, C++ and PL/1. Even a simple task like the introduction of the International Bank Account Number requires the rewriting of thousands of lines of code, with a risk that the vast edifice could come crashing down. Hundreds of projects updating the system are underway at any time, in just the same way as the medieval stonework of a cathedral is constantly undergoing a programme of repair and replacement (Murer, Bonati and Furer, 2011: 12-14).

The distinguished computer scientist and 'software archaeologist' Grady Booch has emphasised how software has evolved organically, declaring that:

> *All software-intensive systems have an architecture, but most of the time it's accidental, not intentional. This has led to the condition of most software programming knowledge being tribal and existing more in the heads of its programmers than in some reference manual or publicly available resource*
>
> *(Greenemeier, 2008).*

One central feature of this has been the social institutions which sustain and support craft structures like cathedrals: the guilds of craftsmen, cathedral chapters, the fraternities of laymen. Perhaps we need to build similar sustaining social structures to ensure the future health of the web, and to maintain it's craft character in the face of commercial industrialisation.

Booch's comments suggest striking parallels between software architecture and the way in which medieval cathedrals were built. The master masons who designed medieval cathedrals often carried the overall design in their head, working out details with fellow masons with plans scratched on the floor of lodge buildings on the site. If the master mason suffered an accident, as when William of Sens fell from scaffolding while working on Canterbury Cathedral, this was disastrous for progress on the building. Similarly, the loss of key personnel who understand the history and structure of a complex software system can be disastrous for a business.

How do these parallels between complex software systems and the procedures of medieval masons help us in thinking about the problems that confront us in today's digital world? Some of the lessons are apparent in Eric Raymond's remarkable book, The Cathedral and the Bazaar (2001). Raymond draws a contrast between the carefully planned and managed environments of commercial software development, which Raymond compares to the medieval cathedral built with precision by a small group of experts, and the more ad hoc and organic approach associated with open source developments such as Linux, which Raymond suggests is like a crowded and bustling bazaar. Raymond's book is an important one for Mozilla, since it helped inspire the act that created Mozilla, the release of the source for Netscape Communicator in 1998.

Some of Eric Raymond's historical parallels don't quite work. As we have seen, the approach to the creation of medieval cathedrals was much more organic and evolutionary than he suggests. On the other hand, markets in medieval Europe were much more strictly controlled than the idea of a bazaar suggests. But Eric Raymond's fundamental point about how large structures can grow more effectively by communal and cooperative effort, working from the ground up, is one that is borne out by the medieval cathedral.

The moral of the building of the medieval cathedrals is about cultures of cooperation and shared effort. The most important point to emerge from contemplating the cathedrals concerns craft ways of thinking. Discussions about the role of craft in technology frequently focus on the way in which technology can be a material which the craftsman shapes and uses. But there are other aspects to craft thinking as well. One of these is the development of large structures organically through patterns of pragmatic development and repetition.

The world wide web is perhaps one of the largest examples of such organic craft development. And in thinking about the health of the internet, perhaps we also need to think about how craft structures like medieval cathedrals have been preserved and developed over the centuries.

> *One central feature of this has been the social institutions which sustain and support craft structures like cathedrals: the guilds of craftsmen, cathedral chapters, the fraternities of laymen. Perhaps we need to build similar sustaining social structures to ensure the future health of the web, and to maintain its craft character in the face of commercial industrialisation.*

These craft characteristics are particularly evident with legacy code. Nowadays, few projects are greenfield sites. You will probably inherent some code and other materials from earlier parts of the project. In the case of large systems, this code may be large and may relate to an operating system or computing technology that is no longer supported. Michael Feathers calculates that in many development efforts the amount of legacy code may overwhelm the new code by factors of as much as 100:1 and even 1000:1 (Feathers, 2013).

Yet the legacy code still works. An immediate instinct may be to just rewrite it. Yet often this legacy code works perfectly well, and rewriting it runs the risk of breaking interdependencies elsewhere. The programmer is faced with exactly the same dilemma as the medieval mason. Do you change one bit of the building and risk another part of it falling down? For the medieval architect Lorenz Lechler, the test of any method was a pragmatic one: will it stand up and stay up? In programming, the 'wtf' factor (how much swearing will a change to a programme cause?) represents a similar pragmatic response.

These craft perspectives will become increasingly important as the Internet of Things gains more traction. The way in which objects will become connected to the network in the home and elsewhere will be just as piecemeal and haphazard as a medieval cathedral. When we hook up our networked mirror, we will find it knocks out the networked scales. And login issues will mean that the scales will only show my sister's weight and not mine. The risk of the tower of devices tumbling down will be very high.

Medieval cathedrals suggest, however, that this does not mean we need a managed and heavily regulated approach to using the Internet of Things. The experience of the medieval masons shows how, by keeping things simple and interconnecting design in an open way, large networks can be organically built up. Sometimes the choir will come crashing down, but generally the organic craft-based effect will be spectacular.

The simple techniques developed by medieval masons could be used to create huge edifices because masons had strong social networks to share their knowledge. The guilds and lodges of the medieval masons were like huge idea factories. Maybe, to assure the future health of the internet of things, we need a new form of guild. Perhaps that is what the Open IoT studio might become.

Further Reading

Michael Feathers, Working Effectively With Legacy Code (Upper Saddle River, NJ: Prentice Hall, 2013).

Larry Greememeier, 'Software's Dirty Little Secret', Scientific American 17 June 2008: https://www.scientificamerican.com/article/softwares-dirty-little-secret/

Stephan Murer, Bruno Bonati and Frank Furrer, Managed Evolution: A Strategy for Very Large Information Systems (Heidelberg: Springer, 2011).
Stephen Murray, Beauvais Cathedral: Architecture of Transcendence (Princeton, NJ: Princeton University Press, 1989).
Eric S. Raymond, The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary (Revised edn., Sebastopol, CA: O'Reilly Media, 2001)

Lon Shelby, 'The Geometrical Knowledge of Medieval Master Masons', Speculum 47 (1972), 395-421, reprinted in Lynn Courtney, The Engineering of Medieval Cathedrals (Aldershot: Ashgate, 1997).

Lon Shelby and Robert Mark, 'Late Gothic Structural Design in the "Instructions" of Lorenz Lechler', Architectura 9:2 (1979), 113-31, reprinted in Courtney, Engineering of Medieval Cathedrals.

The Berlin Tapes (digitally remastered)

A reformatted and summarised transcription of a conversation between Jon Rogers, Jayne Wallace & Justin Marshall 18-19/1/17, Mozilla office, Berlin.

What is IoT?

IoT is an amplifier ▪

Jon: Every form of electronics to date has been a replacement, but IoT is additive, not being a more efficient or effective version of something previous, but a change in relationship (e,g, with a light bulb, IoT does not make it brighter or directly more efficient, but allows you to control it in new way).

IoT is not about revolutionising how we use products, but about revolutionizing the collection of data, e.g. collecting health data and surveillance, so it has the potential to be both beneficial and to be scary.

Why do we want to decentralise IoT (thousands of tens, not tens of thousands)?

IoT as **amplifier** and **materializer** of effects and the risks associated with ownership by a few companies could be/is immense.

You need decentralisation to de-risk the opportunity for large scale surveillance, but not limit the benefits of big data understanding of health and other such useful missions.

What do we want from our relationship with our data?

Control of data is the key, and subtler than ownership. Control means knowledge and control of data in specific contexts: some fine, some not. Jon's inhaler example: cloud data on inhalers is good for health, but IoT e-cigarettes sending data of inhaler user to NHS/ whoever is bad, so context of data is significant.

What is a craft?

Making with a craft approach: engagement with materials that is not ends driven, not about aesthetics of efficiency, but an element of the 'art' of meaning making.

Craft thinking: one to the many, personal and localized scaled up (as process not product), rather than universal solutions applied locally, scaled down. Aspects of craft outcomes can be generalizable, but that you are reversing the universal design principle, it is not going from the general to the specific, but from the specific to the general. Generalisation from the bottom up, not the top down.

Research through craft's methodological approach is not problematizing, not solving issues, but settling into a situation, building relationships, being holistic, making things fit, not fixing; it's about dialogue.

Craft is non-brief driven, as opposed to design which usually is. Research through Design has found its home and value in industry. Craft research - where has it gone? Craft has gone into community, like Occupational Therapy.

So, in the context of the realignment of the way things are being made (global mass production and consumption model) Craft talks to a different space, a different post-industrial way of doing things, a community focused way of doing things...

Craft can go into a massively decentralized global community...(maybe!)

Jayne: Design's trajectory is into industry, but craft's trajectory is into the tools for everyday use, so naturally it has gone into the human areas of health care and other areas of complexity and human mess, that's where there is value in it's holistic approach.

Why Craft and IoT?

Craft as a way of thinking about decentralized/localised production, thinking about end to end production.

Craft approach as a way of getting around IoT being owned by large-scale corporations, systems that work against the production of everything in one place (eg; Shenzhen and electronic consumables)

Craft as a way of creating opportunity for more resilience within a system.

Crafting our relationship with data. It is not binary.

Is there something about the nature of IoT that makes the human-centred messy craft approach more or equally valuable to IoT as the industrial design process has been successful for the rest of the electronics/ digital development ?

What are the pros and cons of a craft approach over an established design manufacturing model?

For a craft approach a sense of ownership is central, how does this relate to ownership of data?

Why do we need to be able to go to craftspeople to create IoT objects?

Instead of making tens of millions (the industrial design approach), making millions of tens (the craft batch approach)

BUT does this imply that the IoT objects are in discrete networks of tens? i.e. they are highly focused networks (in geography or number), Jayne's 'Blossom' piece being a great example.

So, in terms of IoT objects, is there is an opportunity for personalised craft (the opposite of universal design), make do and mend, bricolage, creating something in the mess of a particular context/situation/locale, tying into making communities.

Scalability is important, but scalability is in the approach not the solution.
The question is more one of whether this approach to scaling is one of expansion (i.e. growing something that works on a small scale to make it bigger) or is it based on a replication model (i.e if something works on a small scale, create more small scale 'units'), or is it some other approach?

What is a crafted/crafty approach to IoT?

We want to be able to say:

- This is what we mean by crafting in this context
- These are the characteristics
- This is how they can be applied
- This is a demonstration of the outcomes
- This is how it fits into a global argument (political, economic, ethical)

Characteristics of a Craft methodology are:

- applications are recognised through extended engagement (it is time consuming)
- responsive rather than solving things
- dialogue with the materials of a situation (incl. people, data, physical stuff)
- recognising complexity (messy)
- seeking outcomes that are not reliant on large-scale industrial resources (masses of batch, not mass production)
- using technology as a playground. revelling in the means not driving towards ends (but having ends in view - pragmatic view of the relationship between means and ends)
- enchantment (as an experience) and beauty as an emotional tool (how does this relate data visualisation and beauty). Fixing and practical approach on one end, enchantment at the other, it is all human. Mired in the mess. So things move beyond function to include enchantment (beyond pleasurable interactions/interfaces?) Hard to describe, easy to demonstrate, easy to recognise when missing. ('Self-Reflector' from Connected High Street research and Starlight are good examples).
- care and care transmitted through the objects, the way they are made and used (we hope).
- human-centred.
- learning from the periphery (not the centre of the bell curve, but the edges). It allows you to identify particular uses that allow a reconsideration of use/value for the many

You need to be able to amplify and translate ideas into physical prototypes/physical manifestations.

This is true and prototyping is a designerly approach. Craft does not tend to 'prototype' in the same way as design does. I am not sure what you would say the

equivalent is: tests, material experiments, open ended process (play).

Is this one of the places in which we can (want to) make a distinction between crafted and designerly? And what implications does it have for the specific activities that we undertake with interdisciplinary groups?

Are the crafters in the IoT realm coders, experts in data manipulation not the craft community that wrangle physical materials?

What can we do and what are the challenges?

MISSION: Developing a craft methodology for creating an collective ecosystem for IoT

And practically:

What can we do on the ground?

What are the outcomes?

Can you create a decentralized production of IoT based around existing craft communities?

This is top level methodological development (fundamental research) that has the possibility to be tested in wider digital context than just IoT in the future.

How do we move the knowledge and understanding of the very few in the crafts who engage with issues of the digital (e.g. Jayne and Justin) to the many, in order for them to understand the design/craft space they are working in and so respond in a crafty way to the challenges of making IoT objects?

What are the risks of falling back to the 'few experts in a room together' approach?

Jon discussing the 'Self–Reflector' mirror from the 'Connected High Street' project- nothing could have been done without being in the environment that the mirror for example, was created for. You needed the in-depth knowledge of this to provide impetus for the design, you needed the shopkeeper and their professional practice. You need experts of context.

Can we get interdisciplinary groups together to take a crafted approach to an area of interest/concern- what methods do we use? how are they distinct? are they novel?

Is the equivalent challenge in craft that of design thinking within the broader field of design? The debates and challenges to how it is being applied to areas outside the established boundaries of design over the last 15 years or so.

How do we be authentic in our crafted approach?

We involve craft practitioners to close the gap between the realities of where craft exists as a sector (in different contexts and countries) and our academic speculation of how there are 'crafty' ways of thinking and doing that are potentially useful to IoT.
But we need bridging roles. Shared experience and respect are useful bridging mechanisms when engaging with all communities of practice.
For example in a previous collaborative project that involved Jayne Wallace and Sean Kingsley (an experienced ceramicist) working with potters in India, it was Sean (as a doer and a demonstrator of skill and experience) that provided this bridge and broke down barriers.

How many people are actually doing research that puts objects in the world/homes to test?

Bill Gaver thinks little goes on. There are problems of deployment, it takes so little for things to fail.

Justin: But crafting is not necessarily good at creating technically robust prototypes, industry is. So is craft only an ethos, not a practice? We need to remember that craft, unlike some other practices, is a place where ethos and activity should be undivided.

How do we achieve proper Dialogical Collaborative Making, what approaches work?

What this approach is seeking to achieve:

- responsive not interventionist
- nurturing not disruptive
- slow and flexible not fast and agile
- meaningful not novel

This is not as simple as traditional design approaches, where it can feel as if you are going in to get something out. While craft approaches undoubtedly seek to achieve results we believe that engagement through craft can be humbler than some technologically orientated design approaches, in both its modus operandi and its anticipated outcomes. As discussed in other pieces in this publication much of design's history is connected to a mission to create efficient systems for creating things and systems and to formal rationalisation. The ethos of the designer can therefore be one that seeks to take on big and 'wicked' problems and seek rapid transferable solutions, and be recognised for it. While this is both admirable and valuable in many cases, it is not always the most appropriate approach, especially in contexts in which the complexities of social relations, economic, environmental and technology resources are not understood. It is in this context that humbler, smaller scale responses to a situation may have a role to play.

Process/Method

Much of our conversation was focused on the characteristics that we felt might coalesce to define a craft approach to IoT. Naturally these tended towards slightly abstracted meta-level statements and reflections. However, if craft is about anything it is about activity, about practice. Therefore towards the end of our discussion we began to think about how to make these characteristics manifest in actual activities, in a sequential method that takes a multidisciplinary approach while retaining the ethos, if not all the anticipated traditional aspects, of craft. Below is our first attempt at this and is something that we feel could be used as a basic framework for a craft and IoT workshop.

Dialogical making between practices (i.e. all those that can bring something useful to the area of IoT in a particular context)
involves:

Mess of potentialities = Open interdisciplinary conversation, discursive in order to identify characteristics and thingness (Heidegger and the idea that a thing is a way of thinking about an object in terms of all the relations/associations it gathers to itself- it's interrelations)... it is **relational.**

Identify characteristics and established patterns of human behavior and then spend time exploring in as many directions as possible what they mean. You can do this in lots of ways. Jayne - it's a conversation - it's before making things physically. Sharing stories in the wider group.

Narratives of Potential = early sketching/playing (speculative, but not critical, design fiction approaches)

Creating stories that are played out through little sketches, little models. It is about narratives of potential interactions. A lot of the time that is drawing on your own life, your own lived experiences. To whatever extent you've been able to emphasise and understand certain contexts.

Jayne: If I was doing this in a care home I would look to find what an 85 year would find enchanting. Not prototyping the final idea - not just about technology, but about sketching possibilities.

Then split up into our own expertise.

Grounded prototyping = viable, grounded, down to earth, craft, bricolage, to-handedness - grounded in terms of context in which you are working (hospital, market, etc) and grounded in terms of technology (it's doable), socially and technically viable.

Patient Making = collaborative trusting craft making in an appropriate space, enabling technologists and craft to come together in a way that is not functional and service orientated, but discursive and responsive.

Authentic evaluation & legacy = extended, human centred. Reward people you work with, recognising the significance of legacy (incl. friendships), privilege ethical stance.

NOTE: craftspeople and others involved in the process will have differing contributions (in terms of type and volume) at differing stages, so more emphasis on established craft practices at the patient making stage than the others, but it is NOT a handover scenario. The job of a technologist is not to deliver a finished job, but to enable the craftsperson to allow them to complete the job. (e.g glaze knowledge of colour could inform LED research)

NOTE: enforced collaboration is a useful mechanism

Can this process be systemised into set of instructions?
NO: it's a workshop, a guided meditation (like learning an instrument).

Why Craft?

Justin Marshall

As decentralisation is the core theme of this caravan, then looking for practices and communities which naturally, and often unconsciously, embrace this notion seems like a good place to start.

It could be argued that Design is as a modern activity born out of the industrial revolution. The separation of design from production and the divorce of design processes away from direct material engagement have given it strong affinities to centralized mass manufacturing models that aspire to global reach. So if this is what you are looking for then design's natural inclination and history makes it the practice of choice.

In contrast, though independent craft practitioners are consistently seeking ways to create economic viability, they tend not to be driven by economic models that seek to achieve scale through centralisation. Craft relishes a flexible ongoing interaction with the materials and situations to hand; it rarely seeks to create ubiquitous and dominant products. It is orientated towards creating more bespoke, personal/community objects in which value is created through the tailoring of outcomes/artifacts to specific needs and desires, rather than aspiring to design universally appealing high volume products. A craft approach holds the potential to encourage the consideration of localized IoT networks that grow from the bottom up and are not imposed from the top down. It privileges nuance and material sensitivity (in its broadest terms) over technical specification and feature overload. This might mean that a craft approach might facilitate more effectively than other approaches, the creation of simple, feasible, limited data, low power, localized responses to needs and desires within a particular context.

In a recent scoping session in Berlin, working with Jayne Wallace and Jon Rogers, we worked to map some of the characteristics of craft to an approach to IoT development:

A CRAFT mini- MANIFESTO FOR IoT
(is there dogmatism in design)

This is what we think is distinct about something that we call a 'crafty' way of working....

Our intention is to take people from a set of principles to a set of actions.

a. Activities are about nurturing human values, communities and welfare. It is an antidote to 'disruption'.
b. Applications are recognised through extended engagement. It is time consuming with a focus on considering flexibility over agility and being fit (for purpose) instead of being rapid/quick.
c. Responsive to a situation rather than problem solving orientated. It is responsive not interventionist.
d. Involves dialogue with the materials of a situation (incl. people, data, physical stuff). It is about finding a shared working approach between people, objects and their data.
e. Recognises the complexity of situations (messiness), but aspires to beautiful (tidy?) responses.
f. Uses enchantment as an experience and beauty as an emotional tool.
g. Care and care transmitted through the objects, the way they are made and then used. -> the proposition that things can transmit the care that has been given to their creation.
h. Seeks outcomes that are not reliant on large-scale industrial resources. Crafting masses of batches NOT designing for mass production.
i. Using technology as a playground- revelling in the means not driving towards fixed and distant ends.
j. Craft is ongoing and continuous and it understands that you live with and through things. Craft objects therefore are often not considered complete and finalised at the point of delivery/sales/transaction, but it 'acknowledges that in living with and (importantly) through things we not only adjust them, but mould them around ourselves'.
k. Craft takes a 'bottom-up' approach by default. (whereas design may strive to do so, in an inclusive design approach) .
l. Meaning is sought over novelty
m. Finding the resources that are at hand takes precedence over notions of 'perfection'
n. Mending is important.

Fixing and practical approach is at one end, enchantment at the other, it is all human. Mired in the mess. Things move beyond function and novelty towards enchantment. Meaningful NOT novel.

We recognise that this is an oversimplification and that craft and contemporary design (its ever-expanding remit, spheres of influence and methods) share many of their characteristics and should not be set against each other in binary opposition. However, the relative importance of these characteristics, and the configurations in which they are actioned, is distinct. Craft draws particular ways of knowing and acting together and holds them dear.

The human-centred (humane), localised (vernacular) and often idiosyncratic ways in which craft approaches and engages with the world makes it both a challenging and interesting way to think and act within the theme of decentralisation and IoT.

THE INTERNET AS A LOTA

Jayne Wallace

When I was in India, on campus at NID (National Institute of Design), I revisited 'The India Report' written by American designers Charles and Ray Eames in 1958 for the Government of India, which led to the creation of this institution. The report is a product of the Eames spending months in India and involved, in part, them spending time with craft communities.

What is striking is that their words are as valid now as they were when written, and resonate acutely both with contemporary craft and digital cultures globally. If we want to think through craft as a lens onto a healthy internet, this seems like a perfect place to start.

> *"The change India is undergoing is a change in kind not a change of degree. The medium that is producing this change is communication; not some influence of the West on the East. The phenomenon of communication is something that affects a world not a country.*
>
> *The advanced complexities of communication were perhaps felt first in Europe, then West to America which was a fertile tradition-less field. They then moved East and West gathering momentum and striking India with terrific impact – an impact that was made more violent because of India's own complex of isolation, barriers of language, deep-rooted tradition.*
>
> *The decisions that are made in a tradition-oriented society are apt to be unconscious decisions – in that each situation or action automatically calls for a specified reaction. Behaviour patterns are pre-programmed, pre-set. It is in this climate that handicrafts flourish – changes take place by degrees – there are moments of violence but the security is in the status quo.*
>
> *The nature of a communication-oriented society is different by kind – not by degree."*
>
> *(Eames, C. and Eames, R., 1958. The India Report. National Institute of Design P.3.)*

It is these incremental, considered, "changes by degree" that a person makes in developing something that feels particularly pertinent; when layering a craft way of thinking and doing over our current ways of developing and using the internet. Within a craft methodology changes are made through tentative adjustments guided by testing outcomes at each stage for 'fit' or rightness, and by seeing each situation as something unique in its texture (even though long established "patterns of behaviour" or actions are applied) and requiring specific treatment.

This tweaking, adjusting, refining, is accompanied by what the Eames' call "moments of violence." Which, I'm seeing in this context as actions such as striking metal with force to form a desired shape, after which more gentle actions such as planishing, filing, or polishing, adjust the form into the ultimate outcome. To give their abstractions solidity the Eames used an example of the Indian "Lota" - a small, usually spherical water vessel used for personal hygiene.

You can similarly view the internet as a Lota pot - something that has been crafted and designed over a generation by the billions of people who use it. By following the Eames' observations further, the explanation for this rationale will become clearer..

North Indian Brass Lota, Image © Victoria and Albert Museum

North Indian Brass Lota, Image © Victoria and Albert Museum

Putting a craft lens onto the question of 'what constitutes a healthy internet' brings with it an understanding and value that the voice of the individual is valid, and that all things can be altered to better fit the contextual purpose for which they are used. This is the antithesis of, firstly, an ascribed form of perfection; secondly, the notion of something being 'finished', and thirdly, of passive consumption. The craft ethos, rather, is one in which attunement of a thing by an individual is a welcomed part of life.

You can similarly view the internet as a Lota pot - something that has been crafted and designed over a generation by the billions of people who use it. By following the Eames' observations further, the explanation for this rationale will become clearer..

> *"A "simple vessel of everyday use, stands out as perhaps the greatest, the most beautiful. (...) But how would one go about designing a Lota? First one would have to shut out all preconceived ideas on the subject and then begin to consider factor after factor (for example):*
> *- The optimum amount of liquid to be fetched, carried, poured and stored in a prescribed set of circumstances.*
> *- The size and strength and gender of the hands (if hands) that would manipulate it.*
> *- The way it is to be transported – head, hip, hand, basket or cart.*
> *- Its sculpture as complement to the rhythmic motion of walking or a static post at the well.*
> *- What is the possible material ?*
> *(...)*
>
> *Of course, no one man could have possibly designed the Lota. The number of combinations of factors to be considered gets to be astronomical – no one man designed the Lota but many men over many generations. Many individuals represented in their own way through something they may have added or may have removed or through some quality of which they were particularly aware."*
>
> *(Eames, C. and Eames, R., 1958. The India Report. National Institute of Design P. 4&5.)*

What Eames describes is both craft as a process, as well as methodology. They also detail the way that things evolve and come into being through a decentralized mode of engagement.

The Lota, like the internet, is not specific to one individual. Being a shared form, many numbers of individuals have refined, tweaked and developed the Lota over time because they observed through their use of it, changes that would improve it. Craft thinking and doing is always tethered to lived experience and the insights gained, often embodied, through a physical engagement with something. It is an ethos of engagement, whereby living with the things at the centre of an enquiry and gaining insights, enable incremental changes to be applied.

Putting a craft lens onto the question of 'what constitutes a healthy internet' brings with it an understanding and value that the voice of the individual is valid, and that all things can be altered to better fit the contextual purpose for which they are used.

This is the antithesis of, firstly, an ascribed form of perfection; secondly, the notion of something being 'finished', and thirdly, of passive consumption. The craft ethos, rather, is one in which attunement of a thing by an individual is a welcomed part of life. It acknowledges that in living with and (importantly) through things, we not only adjust them, but mould them around ourselves. If we subscribe to this 'craft lens' for the internet we see that there is no perfect 'thing' - all things can change - and nothing is ever 'finished'. Craft (separate to design) is in a constant state of 'becoming', which is hugely useful as an ethos - because it is in harmony with the fact that people, just by being people, are also essentially decentralized and ever changing entities. Therefore a 'craft lens' can help us reflect on issues/situations/challenges from a deeply humanistic point of view.

To continue the metaphor of the internet as a Lota pot, whilst the "big five" (Apple, Google, Microsoft, Amazon, and Facebook) may claim to be the internet, in reality they are part of a vessel that has been tweaked and hammered into existence by billions of users/owners. They can, of course, sell a dominant version of a Lota pot (internet), but they can't, presently, deny the existence of others.

Through the over-control of content creation and consumption we can see that companies like Facebook don't see the 'Internet-Lota' pot as a crafted thing that has been made by many and evolved by their hands over time. They merely see users as adding content within Facebook's own rigidly framed scaffolds and identity. More significantly the "big five" companies are averse to a crafted object, and want a final solution.

One of the biggest problems we currently face is that social media monopolies like Facebook now have the financial and political power to stop us from crafting our own web. They can prevent us from tweaking, adapting and creating an internet that fits us and can confine us to a standardised internet space and materiality where only facsimiles of their vision can co-exist. This promotes a form of passive consumption that not only stifles and controls people who use it, but also denies an evolution of digital communication that is analogous to being human in that we are ever-becoming, decentralized 'things'.

Michelle's response to Jayne

Hey Jayne,

Thank you for writing this and for sharing!

I love the citation of the Eames and the example of the lota pot. A few questions / ideas that arose while reading:

- As brief context, why the craft approach was important to Eames and NID / India and what is it's legacy? Maybe there's some milestone or story we can reference as evidence that this approach benefited students and Indian society since the India Report was written.
- When I think about the craft approach, I usually imagine a crafts person (an individual) that is part of a community making an object. With the example of the lota, it seems more like the platonic outcome of many crafts people, some working in coordination and communication with each other, while others just iterated on their own. How do we imagine the roles of an individual practitioner vs. their community of practice vs. the users they work with and for? How does this affect the craft methodology?
- In the case of the lota, the craft approach might have gotten us the "ideal" object, i.e. perfect in its general form. Yet it took many specific implementations to get there. It's somehow an expression of the crafts people, iteration, and experimentation in a physical form.
- It'd be great to pull up your thesis on how craft is different from design and why that matters for healthy practices.
- In the examples of Facebook, etc. one of the challenges is that they start to own "the means of production" of the internet. That means, the materials, the forms, the contexts for digital content are determined by this company, rather than individuals within their communities. Are there political equivalents in craft communities, where perhaps a company or government took control of the production and stifled innovation and expression? Where there any good examples of resistance, like the Gandhi of crafts?

Sorry, lots of notes. Loving the thinking and how to develop this out. Happy to share more or explain things better where needed!

-- Michelle

A Conversation on Craft - Jayne Wallace interviews Vineeta & Praveen Nahar

National Institute of Design- Ahmedabad, India
March 2017

Excerpts from interview:

Jayne Wallace talked to our friends and hosts at NID, Praveen and Vineeta Nahar. Praveen leads the industrial design programme at NID and was a close friend to his mentor the late MP Ranjan "Professor Bamboo'. Vineeta runs Active Hands, an independent craft and learning business that creates learning kits for young people to learn new traditional crafts. Jayne met them in their home and talked to them about craft.

V = Vineeta // P = Praveen // J = Jayne

V = What I think is important for learning is the materials, tools, processes and then feeling it with your hands. It is very important that you have to go through the experience, not just by seeing, but by going through the experience you get into a lot of problems when you really do it yourself. When you're seeing you don't get into problems, you think it is easy and I'll be able to do it. But it is when you're doing it that a lot of issues come up and resolving those problems makes you really understand the nuances of the craft, the small things that you don't pick up when you just see. The more you do it the more in-depth your knowledge is and you then realise how many variations you have when you have that in-depth knowledge.

Opening up new possibilities for people through crafts- I think that is what should be the future for a lot of Indians.

J – So are you talking about pathways to personal resilience? Or ways of doing things yourself and not relying on other people? Buying things other people have made?

V – When you're young yes of course – you can choose to make things to give to other people – but children don't value crafts. They want fancy looking things, they don't value things that are made by hand, so once they do it they understand the value and they are able to translate this value to others who are not doing – it's very important to translate to others – so when they are gifting they realise that others don't value the effort in making by hand – so the children start to learn who values what and what to give to whom!

J – Praveen how does craft play out in your practice? Are you a maker?

P – Yes and No. My interface with Crafts – I appreciate the way in which craft comes into play, largely because I work here and I see the interface between design and craft. I think my role is more designer as ethnographer empathising with the crafts rather than practising it, but I help people who get into practicing it. I can be a catalyst in some ways.

V – I feel that crafts are much more healthy than the industries

P – Craft also has a lot to do with different contexts – socio, cultural...

V – You have to respect the craft and the craftsman

P – Well, thinking about what she says and people not wanting to work like this anymore – people have suffered for generations doing that because they have been sidelined in the mainstream of society. There are many complex societal constraints that still exist. Another thing is in terms of looking at potters – the future of the potters and what they were making – the

potter is an integral part of any living society as a service provider making utensils and objects of daily use – potters, blacksmith, jewellers. There are maybe some that are still doing this and still exist. But now whole lifestyles have changed and the crafts have not evolved to suit the new lifestyle – so the desire for those objects is no longer high, handmade objects have gone down in value.

J – We saw that even with the diyas – people buying imported ones from China with LEDs inside...

P – Yes, because people have so many choices to pick up...

V – These mud utensils are the best to cook in, but they are the least preferred because of their breakability and all these issues. However if you cook food in them it enhances the nutrition, whereas all other kinds of utensils reduce the nutritional value of food, but still nobody uses it.

J – When I say is there a relationship between craft and health, what does it make you think of?

P – You mean health or wellbeing?

J – Both – it's a big term

P – Healthy lifestyle- she has given an example of how an earthen pot could be used for to make healthier food and it benefits you in certain ways – like the clay pot we use in the house, we use it because it cools the water.

V – The bacteria that the fridge produces in the water is very harmful for your throat...

P – The clay pot actually creates a difference from outside to inside, that is just enough

J – That is about the using of craft objects, what about the making of craft objects?

P – Making of craft objects – I mean, if we're looking in terms of occupational health it also depends upon how and which craft and how they're practicing it. Practicing papier mâché in a very closed space in Kashmir in extreme winter will mean you are engaged in that activity and since you are not engaged in anything else, that can be a useful distraction. Most crafts don't exist in isolation, because people do something else alongside – i.e. they're farmers and they're also craftsmen. In the villages when they cannot farm, they practice crafts, like the example I gave of Kashmir. In the summers they go out and sell and in the winters, they are inside and making these objects. So it has different elements – it could be extremely meditative as a solo, slow, concentrated process. But if done to service a supply alone and if there is a big demand for it, it becomes occupationally dangerous. But at the same time the adaptability of people who are making things and adopting multiple postures through their day- it is much healthier. In terms of the postures whilst making things – they make things with their whole body.

J – Because it is such an embodied thing

P – Yes

V – Yes, children for example involve their entire bodies when they are involved in craft-making. When your hands are active, your mind is also active and you are also thinking. Your motor skills develop, your precision improves. The concentration required to weave even a small piece of fabric is so high, as you are sitting with one piece for a long time and during that time, you are concentrating on one thing. It becomes a meditative process. As opposed to looking at a screen, which reduces concentration because of the flashes and causes stress, impulsiveness and hyperactivity. There is also a lot of play in making; it may look like a mess while they are doing it, but the enthusiasm that comes with knowing how to make something and then make variations of it is very important. Children nowadays are not excited by anything; you take them to the mall and buy them things and they are excited but it doesn't last. Here they are generating their own excitement from within.

J – What you're talking about is a way of bringing something into being – a material...

V - YES – bringing into being – so they're dreaming about it – excited from within to produce something. It is a very important life skill.

J – You are talking about something that is not necessarily about heading towards a particular goal (beyond completing this thing they are making). You are talking about play and exploration.

P – Yes, exploration...

V – You know even if you show them a star, a new star, children are not excited! Why? They are not excited about anything! That is the whole problem – education is becoming so passive.

J - Do you find this with your students Praveen? Vineeta is talking about this at a very young age, do you even have to try to energise your older students?

P – Specifically here at NID, people are learning by doing. Making is part of what they are here for so it is not so much of a problem. But over the years we had some kind of over-excitement over technology. People were overly excited about doing 3D modelling and simulations on the computer. A lot of design schools have really lost the in-between – between making by hand and by computer. But in the last few years, it has come back and people are actually now interested in the exploration of making.

J – What do you think has caused that? There is an excitement of this new kind of digital making and now they've seen the limitations of that.

P – Yes

J – And that it's just part of the spectrum of things you can make...

P – Yes, that is how a lot of excitement in making is coming back again. The other thing is that it used to be harder, the act of making. Now the hardships of making has gone down.

J – You've started talking about the digital there – if we think about this new wave of things – the Internet of Things – where a lot of the things around us will be connected, will be talking to each other – where does craft sit in that firstly? Does craft – and a lot of the IoT objects that we see at the moment, which are things like smart fridges - you can monitor if things are going off in your fridge from a distance – you can turn your heating on via an app on your phone - this is a very different image of living, a very different world than the one we've been talking about, filled with craft objects. If this is the world that is going to grow bigger, where do you think craft sits within it?

P – I think – the relationship of making – the democratisation of innovation and thinking about making by yourself and also thinking about the democratisation of technology - i.e. not getting it done by others, but exploring the technology by yourself – when it has been demystified to a level that people can do it, then we can think about what the digital future looks like for people.

So I think there will be another kind of making and thinking digital and the democratisation of both will go into the mix. Probably there will be some fusion, where we will start seeing crafts in the way people start personalising technology for themselves. They will want to see specific personal forms of technology and that's when craft will start becoming relevant.

J – Does that feel ok to you?

P – Does that feel ok to me? So if it these are things, technology things, which complement me and support me – things that I need, then that is fine.

V – Thinking about democratisation...when these children grow up and they are customising it for their own needs, and as long as they are able to understand this and do it for themselves, it will become a much better world. It won't be the same in every house or every person's life, but customised. There will be a lot of crafts where they would be interfacing with technology. They will be making their own technologies through crafts. At that point, it will be really interesting, as they won't be just buying it or getting it done by someone else, but living their lives according to what they really want. Not everyone would want their heater to be on before they reach home, but when they are able to customise things, it will enhance their lives rather than making them more dependent on technology.

P – The crafts – we are seeing crafts as objects and we're capturing the lifecycle of those objects through technology. You'll have this extreme IoT that tells you what is the wear and tear of specific things you have; it will be interesting to see how craft objects live in the IoT.

V – Ceramics are the oldest living crafts on earth, they don't get destroyed. It is ceramics found from previous civilisations that have told people about them. So I think crafts will live on.

J – At Mozilla and the Open IoT studio, they're trying to think of ways that we can have a healthy internet – a healthy IoT and we're trying to think if anything about the craft methodology could be useful to that. I've just read the Eames report again from 1958 and the way that they talk about an object like the lota that has been made by many, through small tweaks over the years, is similar to how the internet has been made by many over

the years. But now we've got these big five companies who are owning the tools of production. From your perspectives do you think a craft methodology – this way of exploring and trying to add on iterations, doing it yourself, but being part of a whole of many – might give us a useful way in to thinking about a healthy internet or maybe we're clutching at a straw that isn't that helpful?

P – Healthy internet – wow – so you're looking at the parallels between craft and healthy internet, or the difference? Or a combination of the two?

J – For instance, perhaps if we document one view of what a craft process is and then use that as a lens in. Like if we created an internet search engine that enabled you to explore in a craft way...

P – What craft offers is that not everything is controlled. You explore and make and create you find your own way. The whole cycle of things is under your control, which has some impact on external things. But maybe we could look at crafts and the internet and build something around it to build new scope for the way people do things.

J – There are potentially some useful aspects like craftspeople usually doing things by themselves but being in a community of others. We're trying to think of useful metaphors.

P – Metaphors, yes

J – Craft – you've said this yourself Vineeta – "to craft is to care". Thinking of what you said about children, if they have put this care into making something then they are not going to give it to someone who won't appreciate that effort. They would choose carefully who they would give it to. It comes with a conveyance of value from someone personally making it, so that might be a useful metaphor?

P – The slowness of craft and these processes might be a useful metaphor. A lot of thought goes into something - the speed and time in context is also something to consider...

J – Do you agree – one of the ways that I see a design methodology or a design ethos being different to a craft ethos, personally, is I see designers always trying to improve life.

P – The quality of life, not life

J – Yes, and they smooth out whatever the situation is. Craft instead sees the mess. Being human is a messy business.

P - Yes

J – And craft just seems to just get in there with the mess. So the pots might not be quite perfect but they're useful. It's not about trying to have some smoother vision of what it means to be a human. But you Praveen, might see that from a very different perspective because you're a designer.

P – No, I'm not a designer.

J – No?

P – I'm not a designer but at the same time I'm very conscious about the fact that there are very different ideas about design that exist and that people practice. Design for me is also very different when it comes to crafts or making objects – it comes from the society and how the designer or object plays an important part in that. Also I think that people get these diverse extreme exposure to things and we're looking at these maker communities and we're looking at the way the world is moving towards global production. We have both perspectives actually so you're not completely sold out to one, just basing it on one but appreciating both perspectives actually, so there's something very different.

V – I think being in this position where you're balancing both the things and not just appreciating one and not the other, I'm thinking that this is the only solution to life. The balance happens only when you understand both very well. You need to be between the both.

P – I think the post-mining economy – or the post-industrial economy – the value of objects and possessions will be much more and they could be appreciated much more. Especially, of course, for objects which are made from materials which are gone.

J – Finite resources? Is that what you mean?

P – Finite resources, yes. So the thing is, I see a lot of value in efficient user resources, in optimising and finding knowledge about things and materials, in mending things and making them last in that context.

J – The internet of broken things...

P – Yeah, the internet of broken things – bringing them together and seeing the value of extending the life of things

J – I'm thinking about the ethos of jugaad now- with digital objects, there must be lots of potential there.

V – Yeah, digital jugaad

P – One of our students is doing a project on digital crafts...

J – Well thank you. That has given me loads of food for thought.

Localised tools for local contexts:
Vernacular IoT

Justin Marshall

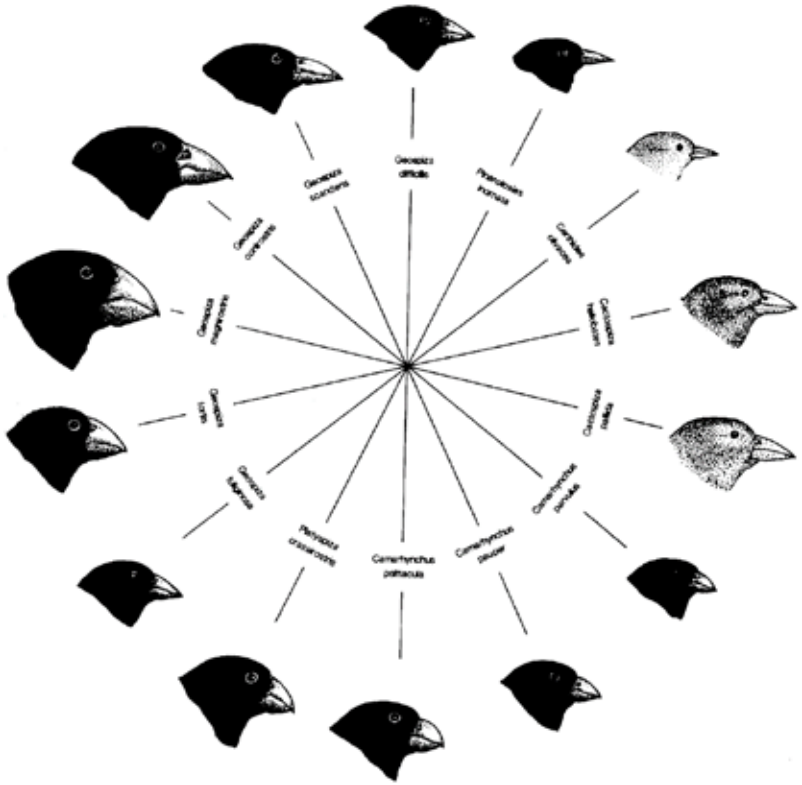
Decentralisation was one of the framing themes for our Goa Caravan and this focus got me thinking about what some of the consequences and manifestations of pre-centralisation have been - thinking about the 18th and 19th century UK pre-industrial landscape of production, or making, or craft. Obviously agriculture and associated activities played a far larger role in the UK economy and employed a large proportion of the labour force than it does today. But agriculture is still a significant part of many countries' economies, including India, and therefore I thought an appropriate place from which to start.

But this piece is not going to be another utopian eulogy to a pre-mechanised world of rural idylls, undivided labour and the happy artisan.....phew! I am interested in the way in which decentralized production provided an environment for a common form to proliferate numerous varieties, in response to local contexts and cultures.

The Billhook is a seemingly simple one-handed (generally) cutting tool used for a range of pruning, hedging and coppicing activities which has a history that can be traced at least as far back as 1000BC and has close relatives all around the globe (e.g the Indian akkuruval).

Bill hook at Ludow market. Retrieved from https://upload.wikimedia.org/wikipedia/commons/9/9c/Antique_billhooks_at_Ludlow_market.JPG 29/4/17

...when local production is independent of centralized systems and truly grounded in the needs of a local community (rather than being some form of centrally controlled franchise model), it facilitates the crafted evolution of artefacts/tools/technologies that are fit for the specific needs of the context out of which they were born. I would argue that there is value in this approach to IoT and to systems and platform development. There is no less need for internet connected devices to be context specific, or at the very least nuanced to context.



A selection of finches adapted to their specific environment

Like the Lota discussed by Jayne in her 'Craft and Internet Health' piece, it is an artefact that has found its form/s over thousands of iterations, not so much designed as evolved. This evolution has bred (like Darwin's finches in the Galapagos) species of bill hooks with a huge variety of nuances and specialist adaptations across geographical regions in the UK (this regional variance is not a UK-specific phenomenon and could also be identified across many other countries).

Below are the variances in shape from county to county (differences have also been identified from town to town, with an extreme example being a unique billhook design produced within a village with a working population of less than 50!).

Regional billhook designs (date unknown): reproduction from article by Jack Wilson in The Countryman, Autumn 1982. Retrieved from http://billhooks.co.uk/ 22/4/1

These tools have historically been produced locally by the local makerspace (i.e the smithy). The regional differences found in blade length, beek shape, hooks size, etc. are rooted in specific local use driven by the particular environments (cultural and climatic) of the region. So, even across a small country such as the UK, the differing climates and geologies privilege particular indigenous and crop species to flourish more than others and these require slightly differing approaches to management, and this drives the adaptations that the local blacksmith makes to create an optimum tool for the job at hand. This is not a design innovation process, in which there is an aspiration to radically 'rethink' the principles of cutting organic materials and create a rapid, fundamental and ubiquitous change in working processes. But it is an incremental accruing of knowledge and skill to produce hand thought, not just handmade, artefacts. It empowers multiple communities of makers, not just a single designer, and emphasises the importance of local learning / knowledge, and arguably improves local resilience to change (i.e. if the regional agricultural practices change slightly for whatever reason, there are the resources to respond, and designs can be tweaked to make them more effective).

It is interesting to note that the power of this evolutionary craft approach (rather than design innovation method) for generating appropriate tools to achieve particular tasks appears to have been recognised by the centralized urban industrial manufacturers that took over the vast majority of agricultural tool production in the UK by the first half of the 20th century. Even sales catalogues in the 1970's still list tens of billhook designs available, often in multiple sizes, and still named after their regional heritage.

Spear & Jackson after 1974

Image of Spear & Jackson product page, Retrieved from http://billhooks.co.uk/ 22/4/17

To get there at last, is this model of decentralized vernacular making of any relevance and value when considering the challenges of the 21st century internet and burgeoning field of IoT? I would like to reiterate and build on Jayne's reflections on the need to defend and promote a way of engaging with the internet that recognises that the complexities of individual lived experience are important. This is increasingly being restricted/limited by large scale centralized platforms and applications, giving them immense power to control the form (design?) of people's interactions. As they dominate the digital space, it becomes easy to forget there are different ways to formulate interactions that are different and might be more nuanced and poetic e.g. the Duet app built by our friends at Quicksand and Invisible Flock (duet-app.com). Where Jayne emphasises the importance of individual empowerment and control over their digital presence and interactions, I would promote similar aspirations for local communities - for decentralisation. What I think the Billhook story provides is a useful example of how, when local production is independent of centralized systems and truly grounded in the needs of a local community (rather than being some form of centrally controlled franchise model), it facilitates the crafted evolution of artefacts/ tools/technologies that are fit for the specific needs of the context out of which they were born. I would argue that there is value in this approach to IoT and to systems and platform development. There is no less need for internet connected devices to be context specific, or at the very least nuanced to context. The complexities and specificities of the socio-cultural, as well as broad environmental factors, in a given situation need to taken into account when bringing such things into being, and it is through a local crafting (digital), drawing on local knowledge and needs, that this could be most effectively realised. Is this not a healthier, more inclusive, more appropriate , and at the end of the day, more useful way of working.

Before utopianism rears its beardy head too far from the font of craft ale, I recognise that beyond the aspirations and the words there are significant challenges in developing and testing this approach and grounding its ethos in real-world projects. The immediate ones that spring to mind are:

SKILLS: Like the blacksmith, the skills of the technologist are not quickly acquired or easily won. Nurturing local competency and skill capacity is a long term mission, as is its continual development and sustenance.

PEOPLE & ROLES: If the ethos of this approach is grounded in local community knowledge and skills, what roles do people (craftspeople/designers/technologists/ researchers) external to the communities play in facilitating and supporting the instigation of such activities.

MATERIALS AND LOGISTICS: The nature of digital hardware, in its material make-up and micro-scale complexity, makes it impossible to produce locally from scratch. But like the raw materials imported into local blacksmith shops, the componentry required needs to be efficiently sourced and delivered (be at hand when needed).

TIME: This approach is slow, iterative and incremental, not rapid and innovative. How can testing be carried out in a funding environment that wants and expects rapid results, and may promote impact, but rarely funds projects over a long enough period to support it.

I believe the work already carried out within the Craft & IoT Caravan (see the SALVAGE workbook stories) provides a strong rationale for thinking about tackling these challenges in the context of Indian communities and villages. Craft, as both localised production and a way of making a living has got a stronger hold here than in many other countries. In India the spectrum of making within a mixed economy is far wider than in 'post-industrial' countries such as the UK.

This is where we want to work and what we want to tackle.

Crafting through Making - Jayne Wallace interviews Davide Gomba

In this interview Jayne Wallace talks to Davide Gomba. Davide is a veteran of the open source hardware scene - being one of the first to work with Arduino and one of the original team that set up the open source house Casa Jasmina which he is an integral part of. We wanted to know what he thought of the relationship between people, places, craft and digital.

J - You work a lot with data and hardware. How do you treat those as materials? Do you think of data and hardware as materials?

D - I have to say that I don't see them as a material. I see them as effecting a material. Data and hardware influence the things we do. Yet now that you've told me this, maybe I'm going to change my perspective. It's a very interesting provocation.

J - Have you thought about how to make things for a general kind of person and then move to specific needs?

D - We've done workshops in Casa Jasmina about chatbots and the meaning of the home. It's one of the deepest opportunities to put your feet in someone else's shoes.

One example is from Rural Hack, which we organized in the south of Italy in a little farm on top of the Amalfi coast. We stayed with the farmers to learn what their expectations were of the technology, their needs and their budgets. Before the workshop, we tried to index the needs of the average farmer, but these were not average farmers, but farmers who were knowledgeable about certain trends and opportunities and were not scared of these. We had to adapt the syllabus during the workshop with inputs from these farmers.

Also with Massimo Banzi (cofounder of Arduino), I discovered that we tend to discover possibilities, the more we discover relevance to target groups. What I thought would be useful to a group turned out not to be so, in real life. This evolved my thinking.

I'm not even an engineer. My knowledge of technology is mostly based on my curiosity, help from wonderful people and making things. Like creating lamps that react to conversations and emojis. We're exploring the value of the emjoi in a chatbot.

J - How have you negotiated that with emojis? It's fascinating.

D - We made this lamp triggered by a stream of common emojis—the heart, the crying face. I guess people will further customize it. In fact, today I did a workshop with Romit on a MKR1000 that hosted a bot. I did a similar workshop at ThingsCon Amsterdam. A participant adapted what I was demonstrating. He hardcoded these words in the interface, so that if I say "hello", something can be triggered. But if I wanted to turn on a light with a light emoji, I couldn't do that. So he hacked my code very quickly. Most of the people that join my workshops are far better than me at technology. And his hack led us to make a product that is the emoji lamp.

J - A lot of the visuals of emojis are so nuanced that you could get some very interesting parallel things that they trigger. But it's also making me think that if you are working with doing something with the Khadi village, where language is a problem, visual things could help communicate.

D - Emojis are a useful bridge for communicating emotions. Anger or hunger or sadness or nostalgia.

J - It would be wonderful to do something with nostalgia.

D - I guess we would still have to find a nostalgia emoji. Maybe the more we grow our interactions with bots, the more emojis are going to be nuanced and layered.

J - It's making me think about the project that I've just got funding for. How is all of the data that we accrue all around us, the blogs etc, going to enable an ongoing relationship after death?

With modernity in the west, we were asked to detach after a death; to grieve and to move on. In loads of other cultures, it's not about moving on but about being with.

For some people in the west this can be quite harmful. People having to move on might not be the right thing for them psychologically. Just thinking about this circular way of thinking: how you could use the data to get a feel of how somebody would respond to something.

D - Even if that somebody isn't here anymore.

J - I'm really interested in chatbots and thinking from this angle of grieving.

D - It obviously made me think about the Black Mirror episode where you had this app to talk to a beloved that is not with us anymore. And that the very first thing that happened was that this person was able to chat with him using the very same phrases they used to say. If you've seen the episode, you'll remember. It becomes something that doesn't let her go and doesn't allow her to move on.

J - In my project, when people came close to their death, for example with dementia, we tried to create ways that they could represent themselves. Even when their dementia was very profound...when people can't communicate as they'd like to anymore.

Can you imagine going to Casa Jasmina, where it had been collecting all the data of a person, and then you could go visit and spend a week with them there.

D - Yes, with all the IoT devices hooked up, they could behave like someone who is not there any more. Or do things that person used to do.

J- Like the toaster that always burns the toast.

D - Or the temperature is really hot because your ex-wife felt cold. Or the heater is turned on to remind you of her behaviour. It is an interesting and very sensitive topic. And we are far from having such a degree of identity in the IoT space. Maybe chatbots are the beginning...

J - I guess if we do think about the IoT space, it could be an environment that could be smothering, if all of the objects around you were behaving in a way that reminds you of a dead, loved one.

D - Yes, and think about the personalities of connected products. Take for example Google Home or Alexa. They do have personalities. Because one of the closest things we have to a human being is their voice. A lot of people are saying that voice is the new platform on top of which devices will be able to talk to each other, to talk to us, to connect to us.

I have to say I still miss this step. I will have to wait longer than the average user. I am not a native English speaker, and I would rather not put an English speaking bot in my home. So I will have to wait to translate if to Italian.

J - Don't they do that already. Don't they have it in Italian?

D - Yes, I guess so. When the Italian market is ready, I guess they will add things based on the needs of the wealthy. So maybe Germany will be first, and French after that and then a Scandinavian country.

Yes, I guess so. When the Italian market is ready, I guess they will add things based on the needs of the wealthy. So maybe Germany will be first, and French after that and then a Scandinavian country.

There are so many nuances in a language. Think about India, which may not be one of the markets that Alexa addressed actively right now. In India, I heard they have over 80 languages. And also in Italy we have dialects, so voice will be interesting.

I was reading an article about the psychological importance of the gender of the voice talking to you in your house. It's telling you what to do, when to wake up, etc. Is it ok for this voice to be female? Is that respectful?

J - Are these the questions you ask at Casa Jasmina? How is it going?

D - Casa Jasmina? We're working on scaling it up. Next year we plan on a project where you could apply to host another connected apartment. The other thing we are working on is to stabilize the technologies and find new ones that we like. We want to be thoughtful and and invest in toying around with home assistants and several open protocols.

Nowadays Casa Jasmina is on Airbnb. It is tuned to be a temporary house, not a house that's your home. Your home has several utility devices that are made around you, just like the pillow has the shape of your head. Casa Jasmina doesn't...yet.

For more about the Casa Jasmina project visit *http://casajasmina.cc/*

Thinking through making

Justin Marshall & Jayne Wallace

We visited Thomas, a craftsperson/potter/maker/artist/ceramic designer based not far from the Quicksand Studio in Goa. His practice, although firmly rooted in clay, is multi-faceted. He plays multiple roles and has managed to evolve a practice that suits his aspirations, interests and markets. Within his eclectic home, which also serves as a studio and workshop, he is surrounded by functional tableware, studio pottery, ceramic installations, individual sculptural pieces, all mixed together alongside paintings by other artists. There was no sign of the carefully curated and manicured 'brand' image that so often accompanies artists, designers and craftspeople in the UK. That was refreshing. The overall sense was of someone with an urge and ability to make.

One of the many works we saw were the ceramic drums and passive speakers. These speakers, working like a traditional gramophone horn, have docks in which a mobile can be inserted so that its internal speakers are amplified with no additional power. This may not be an entirely new concept, and there are examples of contemporary pre-existing designs produced by both individual makers and sold as products. However, Thomas' approach and the narrative he gave us when describing the creation of these pieces provides a useful example of a particular crafty way of engaging with the material world.

It is about learning what materials will do and experimenting with what happens when an informed and intelligent playfulness is allowed to flourish.

As Thomas explained to Jayne, he didn't set out to make ceramic speakers. He just put his phone in a bowl one day and noticed how much louder the sound from it was. He thought it would be amusing to make a weird musical instrument object for his phone to amplify the sound. He laughed a lot when showing it to us. He realised it was a 'silly' object in some ways with a peculiar anti-digital tech aesthetic.

Jayne, who bought one, reflected that, "I don't think they are very beautiful objects. In fact I think they are quite an ugly object. But to me, it's about play and playfulness."

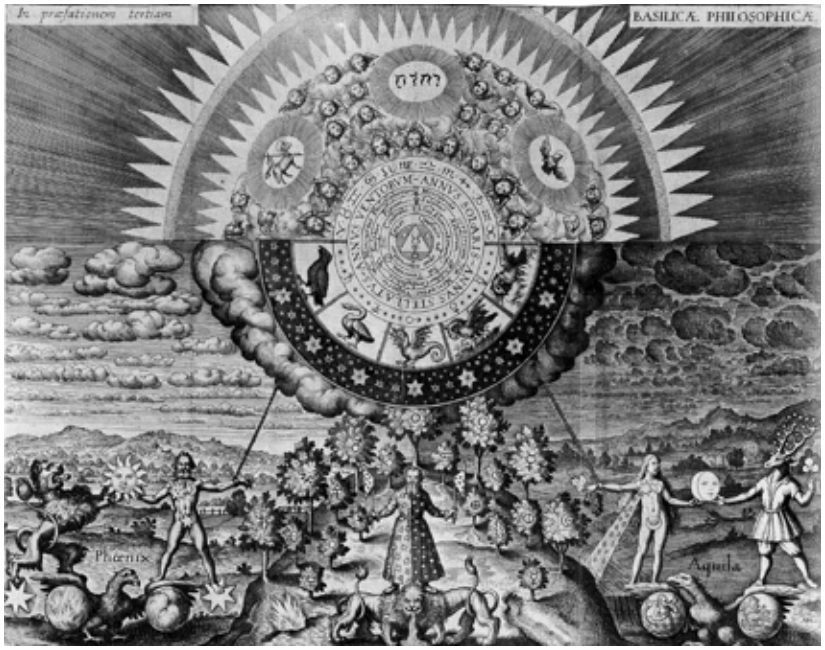
For Jayne this was a beautiful story of a craft practitioner re-inventing something through really knowing his material, living with and through his objects. His bowls are everywhere in his home,and it's a natural place for him to put his phone, finding amusement in how much louder the phone's ring was in the bowl and seeing this as a playful opportunity. It was 'a bit bonkers' and not driven by a desire to innovate in a market, but about amusing himself and making something for his personal use and ending up with something that really exploits the material properties of ceramics brilliantly and is created through well established ceramic production processes, i.e. thrown and extruded forms joined together by hand.

Justin recognised that both the speakers and the drums are relatively simple in their makeup, but the variables are huge: form, dimension, clay body, fired temperature, glaze, wall thickness. All these variables play a part in the differing tone and amplification achieved. Thomas had made a wide variety of drums and speakers, changing and augmenting them, seemingly not to achieve sonic perfection, but to playfully see what would happen.

We would argue that his approach to this body of work is inherently crafty, rather than designerly. He is not looking at this as a problem space in which parameters are separated out and external quantitative knowledge of acoustics is used to develop optimal solutions to transmitting sound. But he is engaging with the material and processes at hand, improvising (knowing in action), thinking through making to produce new outcomes. It is about learning what materials will do and experimenting with what happens when an informed and intelligent playfulness is allowed to flourish. He is perhaps more responsive than critically reflective in his approach to designing and making; the concept of the passive speaker was born out of a response to an acoustic phenomenon, not a reflection on a problem space and the designs were developed through responding to material and process capacities, not a systematic reflection on optimal production strategies.

This could be considered as an alchemical rather that a rationalist scientific approach to materiality, developing things and gaining understanding through the characteristics exhibited by the outcomes (i.e. tonality, volume, timbre etc.). It is more about understanding the whole and less about fragmentary analysis of the parts. This may not be such a controversial or potentially disruptive assertion to the community of craft makers, but what about IoT, which has its foundations firmly rooted within techno-science?

What is, or is there, an Alchemy for IoT and would it bring any benefits?



Alchemical Cosmos, retrieved from http://www.hermetik-international.com/wp-content/uploads/2015/09/Alchemical_Cosmos_Great_Work.jpg 29/4/17.

SALVAGE :

Exploring decentralisation

The centralized structure of the Internet of Things where the agenda is set largely by a handful of private firms is deeply problematic and raises issues around privacy, resilience and marginalisation. The narrative of the IoT is deeply entangled with that of big data and centralized processing & analysis of data from a diverse and vast set of objects that interface with people and communities. Decentralising this narrative, we think, not only will de-risk IoT but will also allow this key piece of technology to be shaped by diverse voices from all over the world.

John Thackara writes an introductory piece for this section, about what a sustainable future could look like, with a focus on social and ecological design, talking about the need to connect with living systems emotionally and focus on the informal and the local, to enable change.

Quicksand's recent work with the Open IoT Studio explored exactly this through decentralized practices of farming, craft and tribal communities in rural South India. We (Babitha, Romit & Selvan) documented what we learned from these communities through Salvage- a collection of essays and notes. Our effort was to learn from these communities, that on the surface are completely disconnected from the IoT discourse, but are in-fact storehouses of thousands of years of knowledge and expertise around building decentralized means of production and livelihood. Among other things, we wanted to probe issues around building trust without hierarchy, sharing of information and expertise in decentralized systems, developing effective production practices that are environmentally friendly and creating awareness around the impact of technologies on people.

Babitha George & Romit Raj

From Gut, to Gaia:
The Internet Of Things and Earth Repair

John Thackara

On a recent visit to @IAAC in Barcelona, I was charmed by their Smart Citizen platform that enables citizens to monitor levels of air or noise pollution around their home or business. The system connects data, people and knowledge based on their location; the device's low power consumption allows it to be placed on balconies and windowsills where power is provided by a solar panel or battery.

https://smartcitizen.me/kits/ https://smartcitizen.me/about

Smart Citizen is just one among a growing array of devices and platforms that can sense everything from the health of a tomato in Brazil, to bacteria in the stomach of a cow in Perthshire- and remotely. This innovation is welcome, but leaves a difficult question unanswered: Under what circumstances will possession of this data contribute to the system transformation that we so urgently need?

when we connect with living systems emotionally and not just rationally, things really begin to change...

What's missing, so far, from the Internet of Things in general, and remote sensing in particular, is a value benchmark against which to analyse the data being generated. We've created a global infrastructure that is brilliant on means, but blind when it comes to ends. A word on the background. Our whole society has been rendered cognitively blind by a metabolic rift between man and the earth. Paved surfaces, and pervasive media, shield us from direct experience of the damage we're inflicting on soils, oceans and forests. The metabolic rift explains how we're able to put the health of the economy above all other concerns. We lust for speed, perfection and control but, because we inhabit an abstract, digitally diminished world, we're blind to the true costs of our activities - either because they are literally invisible or, more often, because they are being felt somewhere else. The environmental impacts of a resource-intensive economy dont touch us directly, so we dont think about them. But they are no less devastating just because they are out of sight and out of mind. For the philosopher John Zerzan our society-wide dissociative mental state began when we placed language, art, and numbers above other ways of knowing the world. Every representation, he argued, both simplifies, and distances, earthly reality. Our reliance on data underpins a concept of progress in which analogue local knowledge is usually downgraded and often disregarded.

We once knew better. For much of human history, the idea that the world around us is vital was literally common knowledge. Greek philosophers known as hylozoists made no distinction between animate and inanimate, spirit and matter. Roman sages thought likewise. In his epic work On The Nature of Things, the poet Lucretius argued that everything is connected, deep down, in a world of matter and energy. Chinese philosophers, too, believed that the ultimate reality of the world is intrinsically connective; in the Tao, everything in the universe, whether animate or inanimate, is embedded in the continuous flow and change. Buddhist texts, too, evoke a universe that is in a state of ceaseless movement and connection. In seventeenth century Europe, the Dutch philosopher Baruch Spinoza conceived of existence as a continuum, an inseparable tangle of body, mind, ideas and matter.

The belief that matter matters, so to speak, was obscured for two intense centuries - first, by the fire and smoke of the thermo-industrial economy, and, more recently, by global communication networks. Now, as this self-devouring system unravels, the healing idea that we are part of a world of living things, not separate from it, is resurfacing.

Developments in science have done much to confirm the proposition that no organism is truly autonomous. These discoveries do much to close the metabolic rift. In diverse contexts, Gaia theory, systems thinking, and resilience science, have shown that our planet is a web of interdependent ecosystems. A new narrative has emerged from the study of sub-microscopic viruses, yeasts, bacteria in our gut, ants, mosses, lichen, slime moulds and mycorrhizae, trees, rivers and climate systems. These natural phenomena are not only connected; their very essence is to be in relationship with other things - including us. On a molecular, atomic and viral level, humanity and the environment literally merge with one another, forging biological alliances as a matter of course.

http://ja-natuurlijk.com/old_site/download/EN-Yes_Naturally_brochure-20111231.pdf

The importance of this new perspective is profound. The division between the thinking self, and the natural world - a division which underpins the whole of modern thought - is beginning to dissolve. It follows that the great work of our time - and an answer to the value question that has so perplexed the Internet of Things - is to re-connect us - viscerally, and emotionally - with the living systems we've lost touch with.

But How?

The tools for such a project are maturing. Low-cost sensing technologies - as exemplified by Barcelona's SmartCitzen - allow citizens to assess the state of the environment directly. We can also measure oil contamination in our local river with a smartphone.

https://www.fastcompany.com/3025300/how-the-bp-oil-spill-launched-a-movement-to-investigate-pollution-with-diy-tools%C2%A0%E2%80%A6

Thousands of people are monitoring the air they breathe using Air Quality Eggs.

http://airqualityegg.com/

An ecology metrics list on Github lists an astonishing three thousand terms - from molecular phylogenetics to microrefugia, from myrmecology to ecophisiology.

https://github.com/weecology/bibliometrics/blob/master/keyword.csv#.UTpZXmbo5I0.twitter

Immersed in this vast and growing cloud of data, scientists are developing tools to analyse, interpret and visualize them. Social networking enables this task to be shared. Attempts are also underway to integrate environmental monitoring, awareness enhancement, and behavioural change within a unified framework. A European platform called Everyaware combines sensing technologies, networking applications and data-processing tools in one platform.

http://www.everyaware.eu/the-everyaware-project/

For Barcelona's SmartCitizen team - and others in the fast-expanding field of citizen science *http://augmentedecology.com/quickstart -* connecting people with their environment creates "more effective and optimized relationships". Well, maybe. As I have argued elsewhere we are still trapped - at a system level - in a "desert of the real".

http://thackara.com/art-perception/desert-of-the-real/

There's no indication, as yet, that possession of this data, on its own, will contribute to the system transformation that we so urgently need. Is this the question to which the Internet of Things is an answer? When we first posed that foundational question at our third Doors of Perception conference, in 1995, ecological monitoring and remote sensing were the most popular suggestions.

http://museum.doorsofperception.com/doors3/day.html

Twenty two years later, the proliferation of tools and platforms to implement those ideas is glorious - but our journey is only half complete. Remote sensing and monitoring have turned not, on their own, to be agents of system change.

Going forward, our work needs to focus on three things.

First, we need to perceive and empathise with ecosystems as systems - not just with their component parts. Biophysical processes - including social-ecological ones - are shaped by forces below our everyday level of perception. We need ways to perceive and empathise not just with energy and nutrient flows, but also with social-economic systems such as credit, and financialisation, which drive the economy to be extractive and ecocidal.

Second: Connecting the dots, revealing system-level patterns, and searching for root causes, will be most effective within a framework of bioregional stewardship.

http://serc.carleton.edu/bioregion/activities.html?&results_start=131.

A bioregion re-connects us with living systems, and each other, through the places where we live. It acknowledges that we live among watersheds, foodsheds, fibersheds, and food systems – not just in cities, towns, or the countryside. Growth, in a bioregion, is redefined as improvements to the health and carrying capacity of the land, and the resilience of communities. It's core value is stewardship, not extraction. A bioregion therefore frames the next economy, not the dying one we have now.

http://thackara.com/place-bioregion/bioregions-notes-on-a-design-agenda/

Third: In our ongoing search for new and better ways of knowing - and being - we have huge amounts to learn from non-literate and indigenous cultures whose experience of the world is more direct than our own. There are no generic solutions to our situation; the way ahead will be based on knowledge that is local, experienced directly, contextual, and embodied. Only when we connect with living systems emotionally, and not just rationally - when we focus on the informal, the local and the conversational - will things really begin to change.

https://medium.com/reflecting-on-toolkits/making-space-for-the-informal-99f0968d1bc0#.gol71057

Salvage: Essays on Decentralization

- Babitha George, Romit Raj & Selvan Thandapani

PRESERVING A GANDHIAN DREAM

The Khadi movement in India was framed as a non-violent protest against foreign control of the economic, cultural and artistic lives of the people. For Gandhi, western economics was a devastating negation of the spiritual identity of an Indian. Self-sufficiency was articulated as an attempt to wrest control from the dominant force of the time – the British empire. However, the spirit of self-sustenance went beyond the rejection of the foreign. Gandhi had a radical and nuanced view of what constituted the Indian nation, that many would now consider not only unviable but perhaps also dangerous. Gandhi insisted that the state empower villages to remain independent economic entities, with local production aligned with local consumption. It promoted a view of the Indian village (historically the truth of this view is disputed but mythically it still holds sway) that existed almost outside of History – as entities that were eternal and unchanging – that were generally left alone by political machinations that were concentrated in cities and frontier areas.

Today India, along with a large number of developed and developing countries, features an integrated and globalised economic order. The Indian Parliament recently passed the Goods and Services Tax which is meant to further integrate the commercial and economic activity in the country, bringing efficiency and reducing leakages. To be sure the Goods and Services Tax is not an attack on the federal nature of the Indian republic and there is nothing unconstitutional about applying a uniform tax code on the whole country. However, a uniform tax code and an integrated economy is not a particularly Gandhian idea. I would hazard a guess that Gandhi, were he to be alive today, would find many problems with a tightly integrated economy and uniform tax codes. The question that we must ask ourselves is this : Can Gandhian thoughts be taken on face value 70 years after independence or were these views relevant for only a time in History and that time has now passed? The purpose of this essay is not to evaluate Gandhian philosophy or even Gandhian economics but to consider the factors in the gutting of the self-sufficient Indian village and what it would take to preserve the Gandhian dream in some form.

A core belief is that the weaver's quality of life should not suffer in the pursuit of growth. They have a fixed maximum limit for production and have constantly sought to educate and in a collaborative way arrive at a sustainable philosophy of production, with the community that works with them.

Khadi in many ways is a manifestation of simple beauty. It represents the things that the modern world has now lost but yearns for – minimalism, sustainability, community based production etc.

We spent half a day with the Janapada Seva trust in a small town in Karnataka near Mysore called Melkote. The Janapada Seva trust is a Gandhian organisation that works in rural welfare through efforts in education, industry, environment and agriculture. The trust runs a Khadi production facility that is seeking to revive the lost tradition of handloom weaving in the Melkote area. In it's small but spacious facility the trust is seeking to educate young people of villages, around the area, to operate handlooms and produce high quality Khadi fabric and garments. The khadi process is done completely by hand, from spinning and weaving to dyeing. Santosh Koulage (son of the founder of the trust, Surendra Koulagi), who handles the day to day operations of the trust told us that the original context in which the local craft of Khadi developed in this area has long disappeared. The Khadi handloom industry was systematically compromised by state bodies tasked with its preservation. Rampant corruption and red-tapisim from state bodies and the lack of social recognition combined to suffocate ambition and pride from the artisans. High skill and adeptness only seemed to be rewarded with poverty and extreme loss of pride. Thus, there are no more traditional weavers who are engaged with the craft, requiring training of a new group of individuals. Nevertheless, the trust has seen significant success in producing a modest line of garments for sale to urban audiences in neighbouring Bangalore, Chennai and other cities. As with most discourses on revival, it is urban markets that are being counted upon as sources of revenue.

We were told that the trust has received criticism for betraying the Gandhian ideal of local production feeding local consumption. We talked about how what the village economy is now producing is too expensive to be consumed in the villages and how what gets consumed in the villages are invariably the cheap industrial produce of the modern economy. Mr. Koulagi however sees no other way. The village as a sustainable economy, community and social entity has been systematically undermined through decades of development and progress focused on urban areas and reflecting urban values and ambitions. This has meant that the only way young people in villages can be persuaded to stay back is to give them a sustainable income and that income cannot be derived from local consumption. Therefore urban markets and elite consumers must be targeted.

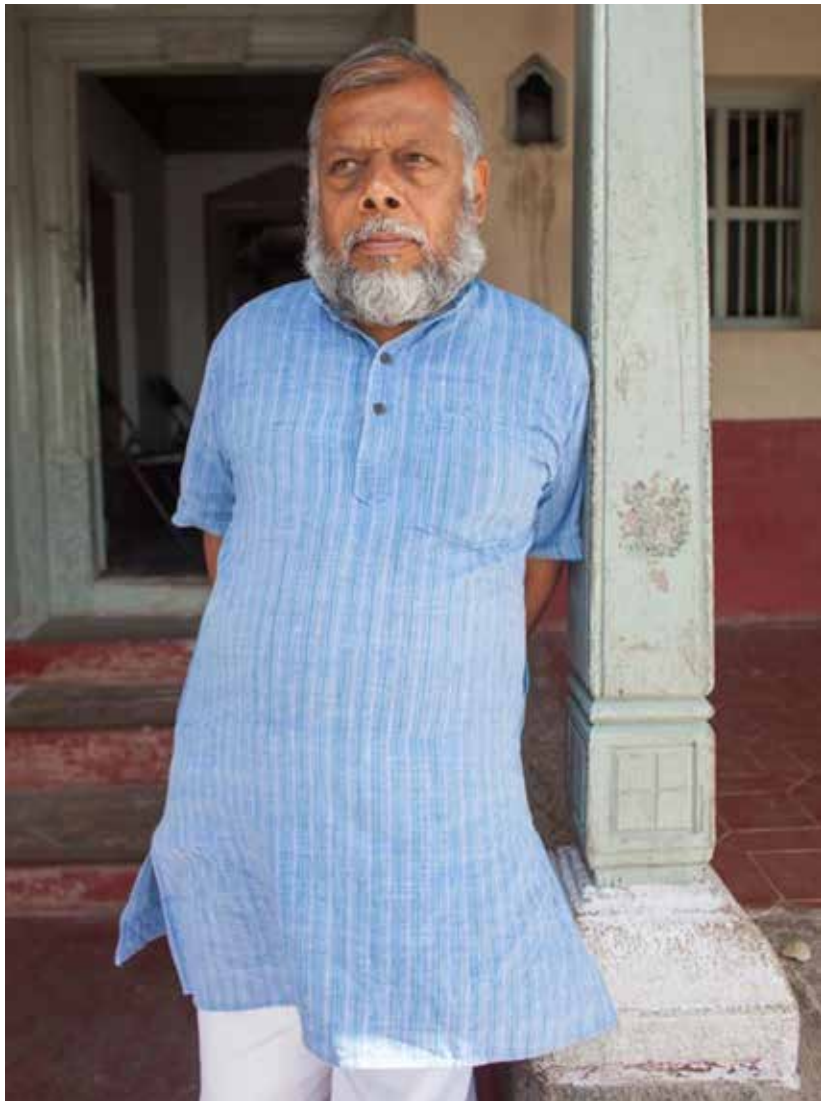
We found particularly interesting, the trust's perspective of focusing on the producers rather than the consumers. It is a counterintuitive way of thinking for those of us who are familiar with the modern economy. The concern of the trust is not primarily consumer satisfaction or product excellence but providing the young people of the villages an acceptable standard of living. This is not to say that the Khadi produce lacks in quality. We are no fashion experts but the Khadi fabric and garments available for sale in the trust's small shop were of high quality and the hand spun Khadi, even after decades of progress in industrial garment production, has a certain charm that is unique to it. What is also unique about this production eco-system is the absence of the profit motive. When organisations don't seek to maximise revenue, it allows them space to pursue other concerns. Mr Koulagi shared with us his apprehensions about working with urban designers and targeting urban markets. He is acutely aware of the consumerism that plagues the modern mindset and he is keen to avoid deep association with it by adapting to overtly cater to an urban market need. Instead the trust seeks to thoughtfully create sustainable livelihoods for the locals by building on existing market trends that are beginning to recognise and value handmade products for their worth.

In a modest rural production facility, the trust is seeking to revive the very essence of the Gandhian dream. It is a tall order but it is quite appropriate that tools are simple and methods honest.

While running the unit requires government certification which the trust has, it strives to not depend on support or subsidies, in keeping with the spirit of khadi. The other aspect through which this manifests is in their notion of scale. A core belief is that the weaver's quality of life should not suffer in the pursuit of growth. They have a fixed maximum limit for production and have constantly sought to educate and in a collaborative way arrive at a sustainable philosophy of production, with the community that works with them. An indiscriminate pursuit of profit and growth , via overtime and imbalanced work hours, is seen as antithetical to the values of the community that the trust is building.

Eventually, the trust's core objective is to revive the Indian village and its rural traditions. Khadi production is one arm of this initiative. The trust also works closely with farmers to promote organic farming and has undertaken efforts to oppose the proliferation of genetically modified seeds. They work with cotton farmers in north Karnataka to support their Khadi production. The trust has also planted local tree species in lands around Melkote that were devastated with the introduction of Eucalyptus in the region. Eucalyptus, an exotic tree species is ill suited for Indian conditions, drawing too much water from the ground and negatively impacting other flora in the region. Apart from this the trust also runs a specialised adoption agency trying to find suitable homes for abandoned and abused children between the ages of one to five.

Mr. Koulagi, feels a deep sense of loss over what has now disappeared. The Gandhian dream of a vibrant, independent and sustainable village is now all but lost. The connectedness of the local with the national and global has meant that villages are no longer buffered from the push and pull of larger political and industrial machinery. Cotton for example was never a mono culture in India and farmers who lost crops due to pest infestations or drought were not severely impacted. Today, the expensive BT Cotton seed forces farmers to grow cotton as a mono-culture cash crop investing all their efforts into it. This cotton crop may be more resistant to pests but when it fails due to lack of irrigation facilities and poor rains, the farmers lose their entire investment. Farmer suicides in cotton growing regions of India have been well documented and though there are various arguments against directly linking farmer suicides to BT Cotton, there can be no doubts about the shortcomings of a one-size-fits-all, top down implementation of modern agricultural practices in contexts where they are not suited.



Mr Santosh Koulagi now runs the trust that was founded by his parents and their friends. Like all Gandhians he too has a polite rage about him against the dismantling of the India that western notions of progress never understood.

As we discussed the future of the Indian village with Mr. Koulagi, we sensed a helplessness that emerged from the understanding of the true power of the modern forces of progress. All efforts of the trust and others like them in preserving the traditions and values of the Indian village come up against this inescapable force. As we traveled from Mr. Koulagi's home to the Khadi production facility, we came upon a boarding school. We were informed that young children from villages around the area were being encouraged to join the boarding school which promised to prepare them for lives in urban areas. This would mean cutting them from the rural context into which they were born. The rural ways of living, vocations and skills that empowered and inspired previous generations in their communities would be lost for them. They would instead be raised in an environment that may appear uninspiring, impersonal and rootless. Mr. Koulagi told us that he chose to home school his son, to keep him connected to the village environment they lived in and imbibe in him the traditions and values of rural India. These are the values and traditions of Gandhi, of sustainable existence, of organic farming, of living in harmony with nature. These values are fundamentally opposed to a consumer driven economy and modern urban life.

We also met with the founder, Surendra Koulagi. It was with curiosity and bemusement that he asked us what we were hoping to learn from their 'small initiative' that had not reached any massive scale of success. In fact, he was honest in admitting that he did not see much of a future for grassroots initiatives that encouraged and promoted local skills, contexts and culture, in light of the larger systems at play in the Indian economy and policy landscape. His question to us, in our attempt to learn from these experiments (often manifested through lifetimes of struggles), was if we had the courage and the resilience to swim against the tide that was swiftly washing away any sort of decentralized agency and sustenance.

By the time we were preparing to leave Melkote we were grasping for a silver lining in this overwhelming gloom. We found it in the story of a young weaver in the trust's production unit. She had lost her husband recently but had also found a job at the weaving facility. She had saved up money and had recently bought a scooter, giving her a new sense of confidence and setting an example for other women and young people in her village. Unlike so many young people in this area, she had chosen not to go to a city but had found gainful employment within the rural setting as a weaver.

Urban India has had a severely negative impact on the rural, sucking away pride, hope and expectation from the rural environment and pulling the best minds to cities and towns. If this trend has to be stopped then more organisations like the Janapada trust are needed to firstly provide sustainable employment to people in rural India within village economies and secondly remind young people of the benefits of a rural lifestyle. Above all a sense of pride needs to return to the Indian village if the Gandhian dream is to survive in some form.

We found a portrait of Gandhi at the Trust office. He seemed to appear forlorn in the portrait and had his eyes shut as if in silent contemplation.

THE PEOPLE FROM WITHIN BAMBOO

The Soligas are a scheduled tribal community in Karnataka. Etymologically, Soliga means one who has emerged from within Bamboo. Soliga people inhabit the BR hills region in Karnataka along with some associated ranges in Karnataka and Tamil Nadu. By some measures, the Soliga population is around 20,000.

We visited the Vivekananda Girijana Kalyana Kendra (VGKK) at BR hills. The VGKK has been working with the tribes in BR hills since 1981. Their efforts have been broad – covering health, education, economy and socio cultural organisation of the tribes. The VGKK largely sees its work in BR hills as tribal empowerment and sensitive integration of tribes in mainstream society. VGKK has acted as a buffer between state policy and tribal communities, working to – as they see it – soften and contextualise the implementation of the state mandate. In many ways, this is a critical function, as the centralized policy structure of the state is often insensitive to nuances of local contexts.

As you drive into BR Hills, wide flatlands give way to thick forests and winding narrow roads. The forests around BR Hills have been declared a protected tiger reserve and the area boasts a significant number of tigers resulting in the inevitable nature tourism. The VGKK also runs a modest but tasteful resort called Gorukana that is meant to bring self-sustenance to the operation. Gorukana organises daily safaris, one in the morning and one in the evening usually led by young men from the tribal community who have acquired some formal training as naturalists. One senses that most of these men have a deep sense of attachment to the forest and natural aptitude towards guiding outsiders on Safaris.

Large Indian cities are now completely unnatural spaces and yet have fairly settled character. In the larger psyche of the city the separation from the natural world is experienced in vague sub conscious ways and perhaps, in intellectual ways. In BR Hills and among the Soliga people, however- like so many other tribes around the world – this separation seems raw. To us, as it must be for them, the incongruity between their more tribal philosophy, ethics, aesthetics, behaviour and the mainstream society into which they are being integrated is clear. It is visible in a hybrid house in a village close to a forest where half the house is generic concrete construction and the other half is primarily a wood and mud construction. It is visible in stories where Soliga men move to cities to find work and come back a few years later unable to bear the separation and the overwhelming urban life. However, the forest is a shrinking space for tribes in most parts of the world. Even if forests remain, they would as protected sanctuaries – themselves unnatural spaces unable to contain the scope of all economic, cultural and spiritual activities of an entire people. Therefore in the long run, it seems, the Soliga people must integrate into the mainstream economy and culture. Whatever ideological position one may hold for or against their integration, the inevitability of it, requires us all to contribute to a sensitive and smooth integration. The forests themselves as protected sanctuaries should be largely entrusted to tribal communities. This would serve a twofold purpose: firstly it would ensure that the conservation of forest is in the hands of communities that understand it the best and feel a deep sense of connection to it. Secondly it would soften the separation for the tribal communities by keeping them close to the forest and handing them a stake in its conservation. Additionally the tribal communities must be key stakeholders in any discussion to decide the level and type of access that outsiders are given to the forest. They should be empowered to essentially argue and vote for the forest. This would for example mean that large sprawling resorts are not built in forest areas and instead more modest and sustainable accommodations are provided to outsiders.

We got a sense that the VGKK understands these concerns even if they don't clearly articulate it, at least publicly. A lot of their activities are sensitive to some of the concerns raised above. For example, as mentioned before, VGKK helps those young men with a deep passion for the forest to become naturalists and find employment amongst their staff at Gorukana. Gorukana itself is placed as a eco-friendly getaway aimed at those who want to responsibly and respectfully immerse themselves in nature. There is no restaurant at Gorukana, and meals are served at fixed times to guests in an austere dining area. There is no bar (though you can bring your own alcohol) and no room service. Though Gorukana lacks amenities that are common to other mainstream resorts, it is priced at about the same range. The income generated is meant to be reinvested by the VGKK into its tribal affairs after keeping modest profits. A large number of staff at Gorukana are from the local Soliga communities.

VGKK runs a fairly successful cottage operation out of its BR Hills campus. They clearly understand their limits and see their produce as niche and exclusive. Most of what is produced at the VGKK campus is sold to visitors at Gorukana and in small shops in Bangalore. Perhaps the most unique feature of the cottage production at VGKK is that the tribal communities have been made key stakeholders at multiple stages of the production process:

- They are involved in foraging and harvesting directly
- They are, through LAMPS (Large Area Multipurpose) co-operatives involved in financing and wholesale exchange of produce
- They are involved in processing at the VGKK campus

The VGKK also runs a hospital at its campus and the hospital was the first operation started at BR Hills by Dr. H Sudarshan. Dr. Sudarshan, driven by a sense of duty, wanted to establish contact with the tribal communities around BR Hills and facilitate their integration into the mainstream society. Healthcare, more than any other mainstream benefit, helped in establishing this contact.

What remains critical is that the tribal communities are empowered to articulate their view points on these issues and that these view points are given due consideration by the state and other players involved in this process.

Another one of the key initiatives of the VGKK has been the organisation of the tribal communities into representative groups or Sanghas. The members to the Sanghas are appointed by the communities themselves and according to the VGKK, the internal workings of the Sanghas are completely in the hands of these members. Sanghas are envisioned to contribute to both planning and implementation of development programmes in the region by coordinating with the government and other agencies. Sanghas, therefore, are essentially quasi local governance organisations, which, at least in theory, allow the tribal communities to organise into groups to collectively negotiate with the outside in general and the state in specific, the terms of their integration and other activities in areas that they inhabit.

Finally and perhaps most importantly VGKK runs a school as a part of its operations in BR Hills. Even though there are some government schools in the region, most tribal parents who are serious about educating their children send them to the VGKK school. Therefore the training and philosophy that the VGKK school is inculcating in the younger generation of Soligas will play a significant role in shaping the future of the tribe. To their credit the VGKK seem to have a keen understanding of tribal sensibilities and understand the need to continue to preserve tribal traditions and knowledge structures among the next generation. From our interactions with administrators and an ex-student along with some secondary research, we got the sense that the VGKK firmly believes in a values based holistic education that is overall far more sensitive to the context than a government school could be. Additionally, the VGKK provides this education along with food and boarding for free to the tribal communities.

However, even with the best intentions, the mechanics of integration tend to be damaging to human beings caught in them. In our conversations with administrators and teachers at VGKK it became clear that one of their primary goals is to create a batch of capable tribal young people who integrate into the mainstream society as professionals – as doctors, as lawyers, as government officials etc. This goal from the perspective of the VGKK is perfectly understandable; after all it is only through education that true integration can happen. However, to some this may seem as migration of people away from their context which will ultimately result in a collapse of the Soliga identity and traditions. One wonders, what will remain of the Soliga identity 10 years from now. Will their foraging traditions survive as viable means of making a living? Will the Soliga language be still spoken among the communities? Will the people who emerged from within bamboo be able to maintain their deep relationship with the forest? These are large questions that we cannot expect the VGKK to answer. State policy, industrial activity and many other factors will all play significant roles in framing this discourse. What remains critical is that the tribal communities are empowered to articulate their view points on these issues and that these view points are given due consideration by the state and other players involved in this process.

A UNIQUE CHALLENGE FROM A UNIQUE CONTEXT

The Soligas in BR Hills have been resettled into sub-community/Podu level resettlement colonies after the forest was declared a tiger reserve. This has been a step by the government to stop shifting cultivation practices as well as integrate the communities into the mainstream. At one of these villages, we noticed a set of shared toilet facilities right at the entrance. The toilets had prominent signs that declared them to be bio-toilets supported by DRDO technology

(http://drdoficciatac.com/Biodigester/aboutus.asp)

The toilets seemed to be not in use so we enquired with a couple of people who were standing around. They told us that the toilets had been erected about a year ago, to discourage open defecation around the forest. However the pipes that carried the effluent from the toilets were not laid deep enough to account for the wild boar around. The boar had broken through the pipes causing a terrible stink in and around the toilets, which were situated right next to the houses.

The story struck as a vivid example of how change and technology needs to take into account unique aspects and nuances of the context of application. While the proximity of wild boar may not be a design consideration to build a scalable sanitation technology, the application of this technology in BR hills required careful consideration of the unique contextual challenges. What we saw did leave us wondering, if the intervention hadn't actually created a larger public health hazard when compared to the practice of distributed open defecation within the dense forest.

LOST AND FOUND IN TIME

An ancient Silendra lies unused. Courtesy Zen Rainman.

Like every generation that preceded us, we have been endowed with a weak Messianic power, a power to which the past has a claim. This claim cannot be settled cheaply.

Walter Benjamin, Theses on the philosophy of History

The oldest well in Karnataka, which is over a thousand years old is located in a temple in Kolar district. The group of temples called the Ramalingeshwara Temples were, according to Archaeological Survey of India, dated to 399AD. It was later renovated by the Chola Dynasty, perhaps the most prominent of South Indian empires.

We were visiting villages around Kolar district to look at tank restoration efforts undertaken by communities. Most of these tanks, that were being renovated primarily for irrigation, date from the Chola period. With careful observation, ancient embellishments can be seen around these tanks. A carved elephant on a tank Madagu (irrigation gate) transports one back a thousand years when the grand vision of an emperor found resonance among local communities. Naively, you can imagine a time when the objectives of the state were aligned to those of rural communities. To a cynic, a state is always a hegemonic entity – bent on imposing its world view – economically, culturally and spiritually. Yet in India, a narrative of of the self-sufficient village persists to this day. There is a sense that kings and emperors were satisfied with a transactional relationship with the villages. The state would invest in village infrastructure and the village would in-turn pay taxes in the form of produce to the king.

We were curious about myths the way we were about History. In the Indian myth, villages were allowed to retain their organisational and economic structure, which was primarily driven by the caste based occupational system. The exploitation, that is deeply rooted in the caste system has been well understood for

some time. Yet, for centuries the caste system has been the primary organisational mechanism in India. It is therefore deeply entangled with the village ecosystem. The positive aspects of the Indian village such as sustainability, preservation of nature, a vibrant local economy cannot be understood outside of the caste system. We witnessed an illustration of this interweaving relationship during our visit. The distribution of surface water resources for irrigation has traditionally been the occupation of a relatively lower caste in Karnataka. The distributors, called Neerkanti, are required by their occupational code to be fair in the distribution of surface water for irrigation. Once this occupational structure breaks down – in the absence of a community that is instructed to be fair by divine order – the trust in the system is eroded. More recently bore-wells dot the village landscape. Bore-wells are essentially a race to the bottom with every new well digging deeper till the ground water is exhausted. Bore-wells allow for no trust or co-operation. They foster a sense of competition that is eventually destructive to the entire eco-system. There is no convincing organisational system that has been found yet that can successfully replace the Neerkanti.

As we were driving back at the end of our day trip, before the city landscape had swallowed whole the rural, we noticed a raised small stone tank with a tiny hole plugged with a wooden stick. There were two small pillars on the side. We discovered that it was a Silendra, an ancient water container that travellers could utilise. The stone pillars on the side were there so that those carrying a heavy load on their heads or shoulders could find support while they drank water. Villagers would fill these tanks in hopes of accumulating divine blessings by helping a thirsty traveller who they would rarely see. Hardly anyone, even villagers know what they are anymore. They stand abandoned, somehow they have physically survived all the progress around them but functionally they have been lost to time. Suddenly we realised – it is no surprise that the oldest well in Karnataka is within a temple. The religious lives of people in India have always been intricately linked with the village economy and wellbeing.

What pride, what ambitions did those villagers find in their minimal frugal lives? It is the non material, the intangible, the spiritual that has always been central to the Indian story. Without these aspects the village lives and value systems seem unsustainable. The market economy with its strategic efficiency and focus on productivity may be fundamentally at odds with the Indian village. Perhaps, this is the reason that many believe that the Indian village is disappearing. The government of India has promised a hundred new cities to the people of India. Are we moving towards a time when the entire population of India will be living in cities? Maybe there is hope because the village as eco-system is resilient. It has suffered urbanisation, invasions and empires. The modern Indian state is less than a century old. Who is to say that the village will not outlive this modern onslaught?

The religious lives of people in India have always been intricately linked with the village economy and wellbeing. It is the non material, the intangible, the spiritual that has always been central to the Indian story. Without these aspects the village lives and value systems seem unsustainable.

WATER CRISIS IN DODDIGANAHALLI

Doddiganahalli is a medium size village located in Mulbagal taluk of Kolar district, Karnataka. Successive failed monsoons and lack of water conservation systems in the village led to the drying up of open wells and drove the ground water beyond 1000 feet below the ground. The villagers were mostly dependent on water supply from a borewell more than a kilometre away, pumped to a common point close to them.

Indiscriminate extraction, aided by a lack of sharing structures (which exist for surface water distribution) has further depleted the groundwater and made this supply even more erratic. This has forced people in the village to depend on water tankers, a private mechanism that has evolved across India in response to the absence of reliable water supply from civic bodies. This, an expensive alternative, is a limited option for the poor.

There are two hamlets in Doddiganahalli; one is predominantly lower caste while the other is a mix of lower and upper castes.

Jagdish, an unofficial village leader, in an effort to prevent a similar water crisis in the future and to revive existing water bodies, approached different people/organizations for ideas and support. One such organisation was Grama Vikas, a non-governmental organization that works on development of rural and tribal communities. Through Grama Vikas, he met Vishwanath also known as Zen Rainman, an influential practitioner and educator on sustainable water and sanitation.

Just a year ago, this 100-year-old open well was dry and covered with silt. But, that changed when the community came together to revive the two old wells in the village with help from Vishwanath and Grama Vikas. As a reward for their effort, there were big rains within a month and both the wells started collecting water. It has been a year now and both the wells have sufficient water for essential needs.

FARMING PRACTICES – FORGOTTEN OR FORCED TO CHANGE?

M. V. Narasimha Rao, Executive Director, Grama Vikas is not a farmer but he has more than four decades of experience working closely with farmers trying to learn and understand their farming practices. Over the years, he has witnessed a gradual deterioration in groundwater levels, soil health, and farmer appetite to try new things.

"Farmers are forced not to think. They just follow what everyone else in the village is doing. If someone is growing tomatoes then everyone will grow tomatoes. This happens every year." Although Mr.Rao is upset with farmers not reflecting on their past and learning to adapt to the present, his real issue is with markets not supporting farmers when their crop fails or when there is a glut in production.

Mr Rao says, "Behaviour change is key to bring about some change in farming practices. Farmers don't like an outsider teaching them how to farm, so we decided to influence them through their children." As a new initiative, Grama Vikas is working with schools in rural areas to teach children aged 12-15 on soil health, crop diversity for nutritional balance and other farming best practices. Parents are encouraged to donate a small piece of land to their children to grow crops and to practice things they learn within this program at school. However, not all parents are keen to see their kids learn to farm.

As water levels continue to fall in the Kolar region and markets become more open, it remains critical to support farmers with tools and methods that build resilience for these newer conditions, while also integrating community action and traditional knowledge structures that have for centuries supported sustainable agriculture.

Provocations around Decentralisation and IoT

Babitha George & Romit Raj

The endeavour with our open-ended research was to scratch the surface of India's rich tradition of decentralized practices that range from the political to the cultural. These practices, though under pressure now from centralising market and political forces are resilient storehouses of rich traditional knowledge and expertise. Our hope with the research stories was to inspire a new discourse around decentralisation within the IoT space. We also built a few provocations around these stories as a more direct call-to-action.

In the course of our research, there were some principles and rules of engagement that we distilled from conversations with our friend and mentor, S Vishwanath (aka Zen Rainman), from his extended work embedded in communities around water conservation and farming techniques. We sought to keep these aspects in our mind, through the course of our research, as they are equally relevant to the practices of various kinds of traditional communities, not only farmers.

- The othering and systematic breakdown of the local and traditional.
- The Rainman is pragmatic - it is pragmatic to leverage the local and traditional.
- The pathos of the Indian farmer - a tragedy that has been unfolding for thousands of years.
- Community based water conservation works! But it works only when authorities listen. It can sometimes become a token exercise.
- Government engineers and outsiders do not understand local problems and solutions like the people who live there do. It matters little whether these people are educated in modern sciences and technologies. The problems they face and the solutions they frame leverage a deeply local and traditional thinking and often this thinking is relevant and important.
- Do not preach to the farmer about modern methods. The farmer faces incredibly challenging circumstances and does his best to survive through extremely creative means. Talk to him. Understand his perspective. Have some empathy.
- Don't dismiss the intelligence of the farmer. What he knows about the land and his crops is complex and multilayered.

The provocations that we attempted to articulate after our research were meant to provide a landing space for our conversations as a group in Goa. We did recognise that some of these were abstract; however we put it out in order to initiate dialogue. These provocations were also meant to provide briefs (albeit different from usual briefs) that designers could respond to, with more thought and deliberation and to enable them to access the research stories in a way that triggers a response. And not just for designers, but also other people and groups who might call on designers to work with- NGOs, technologists etc.

We recognise that these are not easy questions to resolve and are often too disconnected to make sense within our current discourse. Nevertheless, we wanted to share these via this book to start new conversations and learn more. We have included our initial provocations, as well as our attempt to re-articulate them based on our discussions during the Caravan.

Original Provocation : What is bottom up IoT?

Modified Provocation : What is the sweet spot with IoT? And where do you need to stand your ground even if it doesn't work "perfectly"?

Discussion Points from the workshop : It is perhaps not viable to imagine a completely decentralized system that seeks nothing from the outside. However this should not be the cause to abandon the core principle of decentralisation. Instead of imagining mutually exclusive systems of either complete connectivity or absolute decentralisation, it is probably more beneficial to imagine a gradient between these two extremes. The push for decentralisation in IoT can be seen as an attempt to move objects and production paradigms on this gradient.

Original Provocation : Can we trust centralized processing?

Modified Provocation : Where is the centre of centralized processing?

Discussion Points from the workshop : Centralized data processing is both risky and expensive in terms of resources required. It is risky because often there is a single point of vulnerability and dependence. This raises concerns about privacy and security. Large scale data processing is also expensive and this cost in terms of resources (mineral and human) is often hidden. Can we imagine smaller hubs of data processing that not only reduce risks by spreading out the vulnerability and dependence points, but are also more aware of the resources they are leveraging to conduct this processing?

Original Provocation : Can the IoT save the Gandhian Dream in Indian Villages?

Modified Provocation : What role could technology play in defining what a self-sustaining village could be?

Discussion Points from the workshop: Related to the view that decentralisation is perhaps a gradient, the provocation can be modified to seek not the preservation of the Gandhian dream, but the promotion of the core unit of that dream - the self sustaining village. With LAN based systems and other localised technologies, various groups around the world are already looking to provide rural communities with an ability to capture, analyse and respond to data without the need to connect to large centralized systems. By providing these capabilities and through building local capacity for experimentation and production, villages can move towards a more self-sustaining model.

Original Provocation : How can IoT be relevant to poor farmers who do small scale farming and lack technical skills and support?

Modified Provocation : What role could technology practitioners and experts play in making modern technology more relevant to the farming community? What would be an ideal roadmap to do this?

Discussion Points from the workshop : Globally, especially across Europe and North America, there have been many efforts to introduce small scale maker based technologies to the farming community. There could be little doubt that technology can assist the farmer in monitoring and tracking his farm/garden. This capacity building seems to be happening in a small scale through workshops and other such engagements. Large scale IoT and other technologies are also being introduced to the farming community and it is critical that they are exposed to technologies that are more open and empathetic to their practices while also promoting more sustainable methods. In India small scale farming is a complex ecosystem plagued by deep social, economic and political issues. Therefore in places such as India, a good strategy could be to identify and focus on easy 'ins' into the farming space. This could happen through supporting the organic farming movement among the urban and rural-elite farmers with modern technology. That being said, it is also important to identify opportunities to spread this knowledge to other farmers and ensure that mechanisms that do this are built and supported as part of any technological intervention.

Original Provocation : Can IoT be adapted to leverage traditional skills and knowledge?

Modified Provocation : Can IoT embrace the messy craft process without seeking to simply smooth out tricky issues?

Discussion Points from the workshop : A craft approach embedded in a developed culture and seeking to leverage and preserve a heritage doesn't seek to smooth things out. Design is a smoothing process. Healthy practices are inherently messy and do not try to smooth over tricky issues. What is perhaps most relevant to IoT from the world of traditional craft is the approach of craft, which is usually not primarily about planning and executing, but experimentation and trial & error. ***Choose a journey not a destination.***

Original Provocation : Can IoT power the Informal Economy?

Modified Provocation : Can IoT power the Informal Economy, striving to protect workers' rights and welfare? Can technology be redirected from product development to developing social nets and welfare?

Discussion Points from the workshop : The informal economy is the source of income and sustenance for the majority of Indian people. As such, it is a storehouse of the hopes, dreams, aspirations, innovations, creativity and stories of hundreds of millions of people. In recent years there has been a drive to dissolve the informal economy and merge it, as far as possible, with the formal. This is being done with little sensitivity towards the amazing richness that currently exists and has always existed in the informal economy. Fortunately the informal economy is very resilient and the will of hundreds of millions of people cannot be easily disregarded. As the informal economy gets squeezed by centralising forces, what tools for resilience and resistance can IoT and other more modern technologies provide to stakeholders in this economy?

Original Provocation : Can IoT help us reconnect with storytelling?

Modified Provocation : Can IoT help us reconnect with oral traditions and our spiritual roots?

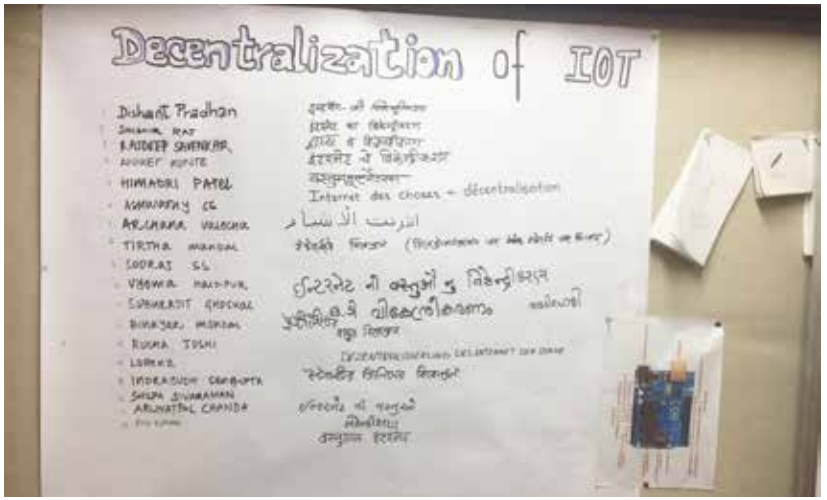
Discussion Points from the workshop : By giving lifeless objects the ability to connect and communicate, IoT is perhaps connecting us to our animistic past where spirits of ***lifeless*** objects were not only relevant but held incredible power over the destinies of men and women. It makes us think about the rights of IoT objects and responsibilities of people who ***give life*** to these objects and ***algorithms.***

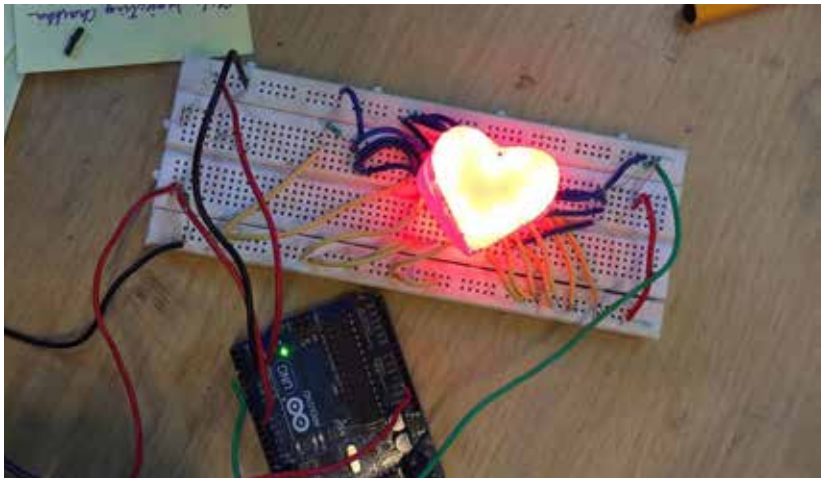
Challenging the Brief: Workshop with Students at NID Ahmedabad

We attempted to put together a brief that departed from usual formats that design students and practitioners are used to. We used the research stories from Salvage to present a new form of inspiration and provocation to students at NID Ahmedabad. The attempt was to allow the students to immerse themselves in the research stories and begin to think openly about what decentralization meant to them. In addition to practices and projects that students identified as examples of decentralized models, they also used the stories to come up with key insights and potential system/product interventions. What was key here was to challenge the classic notion of identifying problems and solutions; instead to recognize and appreciate that there are systems that are working and how do we reframe our mindsets to not think of 'solutions' but ideas that could build on existing practice.

Here are some excerpts from students' work during the week.

"We had to find a balance between extreme ideas and things we could bring into play now. To strike a balance between being extremist or not being true to the Gandhian dream."





"We're used to finding a specific problem. In this it was more speculative and about changing the mindset of other people as well as our own."

"This was different from usual briefs in that it was exploring future concepts - all their other projects have been about solving problems now. It has helped us to question the future. Also we normally work with statistics, we don't usually start with stories."

"This was different in process - it wasn't ideation, development, execution -> it was more circular. It was a cycle of thought-action-thought-action...We liked the pace - it made us stay active."

POLITICS OF IoT

Craft considers the materiality of an object throughout the object's life cycle. Researcher Vladan Joler investigates the death and afterlife of things. From the graveyards of the cargo ships that carry our electronics to the cartels that shorten the lifespan of everyday objects, we begin to see the invisible forces that are making IoT a costly endeavor. Romit Raj builds on these issues with his reflections from the Unbox Caravan in Goa. We must reveal the true costs of production—the impact on the environment, communities, and the individual. Through craft, we may create things that consider these costs wholistically and even offset them.

Michelle Thorne

Death and the Afterlife of Things

Vladan Joler

Albrecht Dürer. Knight, Death and the Devil, 1513.

The Graveyard

In 1995 an art group named Apsolutno investigated the death of two cargo ships in a shipyard of Novi Sad in former Yugoslavia.

Two rusted ocean ships were landlocked more than 1000km from the nearest sea. The artists' forensic study concluded that the ships died under suspicious circumstances: international sanctions, a collapsed economy, war and corruption. [1]

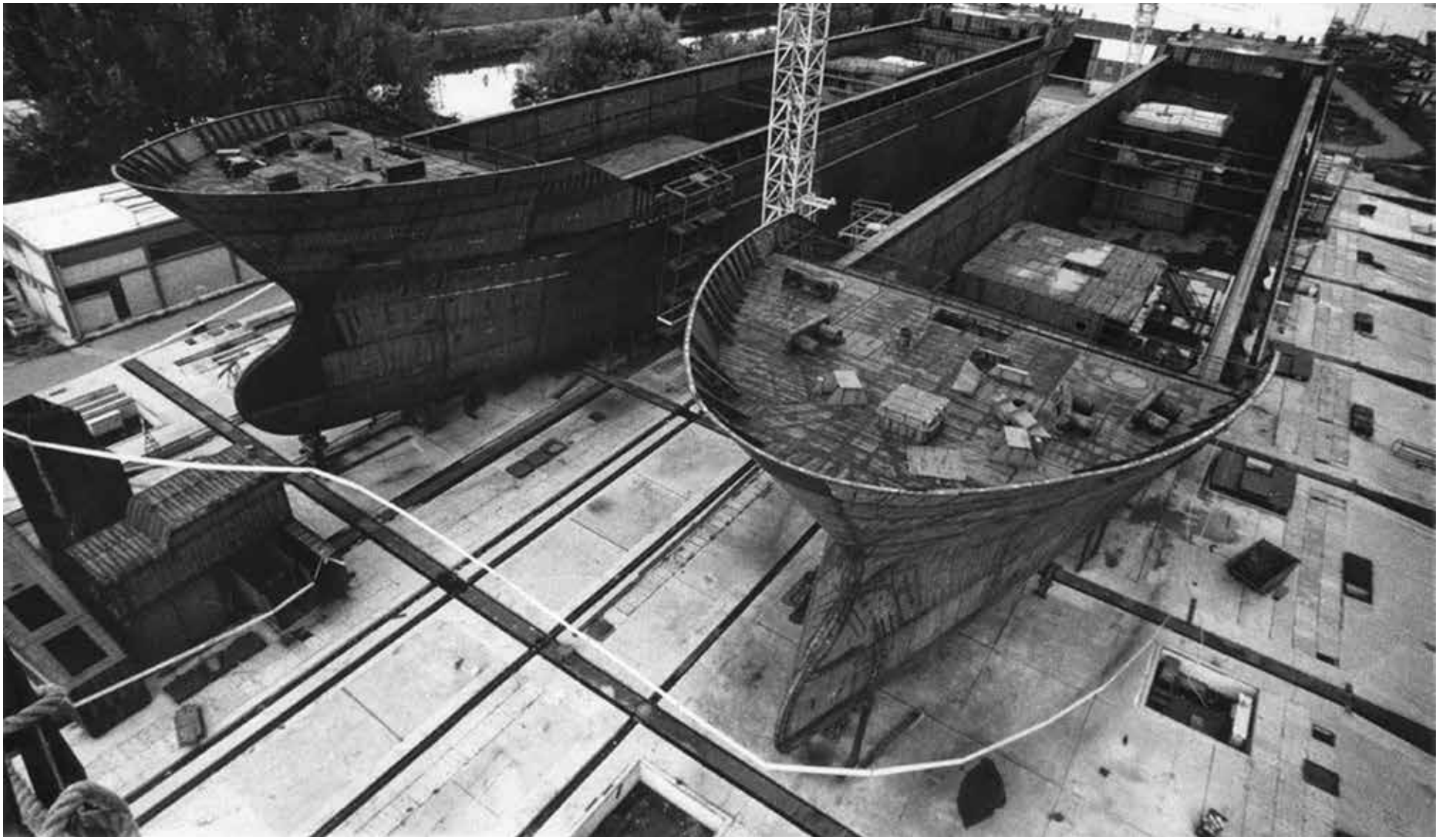
Over twenty years later, we are standing on the shores of the Indian Ocean peering through a camera's telelens. Three National Institute of Design students approach the Alang Ship Recycling Yard, the largest ship graveyard in the world. Here thousands of massive ocean vessels are dismantled under labor-intensive and hazardous conditions. The ships' valuable materials are extracted and the parts resold. Perhaps even the Yugoslav ships are decomposing here.

When it comes to the internet and many things digital, we have a habit of neglecting materiality. The internet's infrastructure is hidden from view, buried or behind barbed wire. The same holds true for the shipping industry. This phenomenon even has a name: sea blindness.

As Share Labs, we conduct investigations into the invisible aspects of the internet. The mining pits, the metal refining factories, the assembly lines, the data centers, the submarine cable landing points, the algorithmic factories or the shipping graveyards are not meant to be seen by us. This physical infrastructure is supposed to be invisible—it should not disturb the cleanness and joy of the Silicon Valley utopia and its immaterial cloud.

Nevertheless, the shipping industry plays a crucial role in our connected devices. That's why we begin our story with the death of a cargo ship.

1 http://www.msuv.org/assets/media/2015_01_apsolutno_sada/apsolutno_sada_045_prateci_sadrzaj/apsolutno_katalog_web.pdf



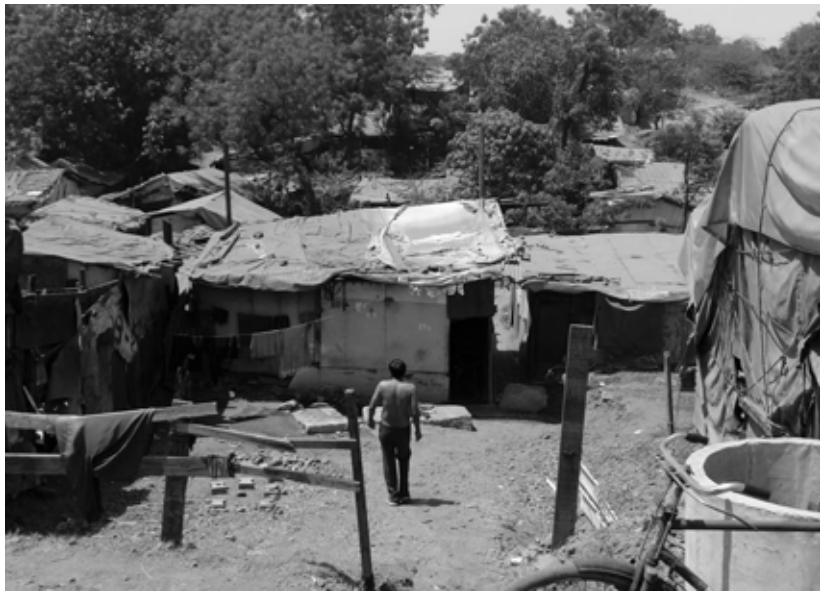
'Absolutely Dead' site-specific action by aA, photo: Vladimir Cervenka.

Explosion in slow motion

Along the edges of the ship graveyard are hundreds of shops, junkyards and workshops dismantling, sorting and finally selling each piece of the ship. They are conducting a kind of live exploded view.

The ship, a complex three dimensional object, is transformed into two dimensional projection of its parts. Millions of sorted, flat pieces are resold. Everything, from the lifeboats to the ceramics, to the engines and even the cleaning supplies and bed sheets are redistributed. An informal settlement nearby houses tens of thousands of migrant workers. Their homes are made out of available materials—in this case, the parts of huge container ships. A local restaurant serves food on a former ship's ceramic plates, and a neighbor is laying on a bed once used by a sailor on the North Sea.

Shops on the borders of the Alang shipyard. Documentation of SHARE Lab and NID investigation.



Workers settlements near Alang beach. Documentation of SHARE Lab and NID investigation.

The Afterlife

From the graveyard, these components will continue their new life. What was once furniture on a luxury cruise ship will now become furniture in a hostel, school, or restaurant in India.

Why are these parts being reused? According to one seller from Alang market, "The quality of wood, steel and other base metals used in the ship's products is supreme. These products are manufactured in developed nations. Moreover products used in ships are of superior quality as they have to sustain for longer period."

This afterlife of things is somewhat unusual in our age of obsolescence. We live in a time when reuse, modification and repair is not encouraged, and in some cases, it is illegal. Many of consumer products we buy are designed to have an artificially limited life. They become obsolete (that is, unfashionable or no longer functional) before it's necessary.

The principle of “access over ownership” is often heralded as a paradigm of efficient consumption and good for society. However, it is potentially achieving the opposite. Society is increasingly wrapped in leases, debt and precarious working and living conditions. Gig-based work performance affects the quality of services we can access.

Planned Obsolescence

Planned obsolescence aims to generate long-term sales volume by shortening the replacement cycle of product. It was pioneered by a particularly notorious cartel in the 1920s. The Phoebus cartel represented the largest producers of light bulbs at the time, among them Osram, Philips, and General Electric. The main mission of the cartel was to control the manufacture and sale of light bulbs. They intentionally shortened the lifespan of their light bulbs to ensure that none of them lasted more than 1,000 hours, which led to more purchases.

The strategy took off and was even encouraged as a method to stimulate the economy after the Great Depression. Aldous Huxley satirized this approach in Brave New World, published in 1932:

> *“Every man, woman and child [is] compelled to consume so much a year in the interest of industry”*

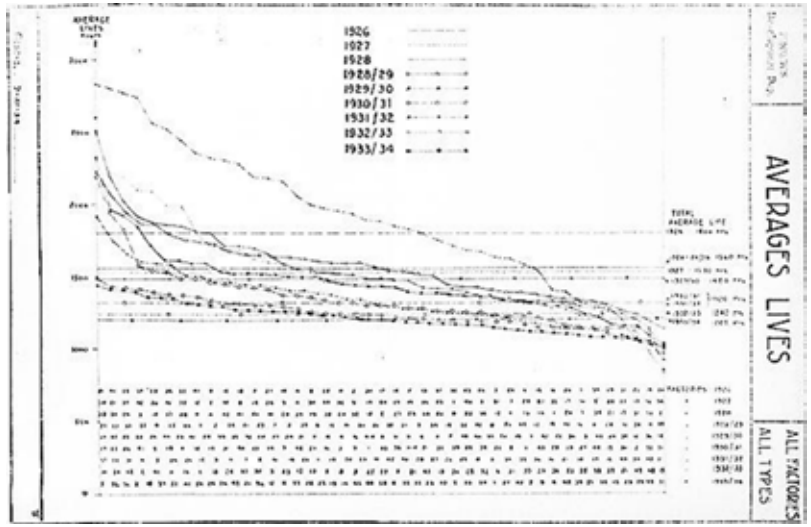


Photo: Landesarchiv Berlin. This graph shows how life spans of light bulbs declined over time, from an average of 1,800 hours in 1926 to 1,205 hours in 1933.

Nowadays, planned obsolescence is the norm in many industries, especially in consumer electronics. The famous Moore's Law[2] states that computer capacity will double every 18 months. In turn, the software industry plans program upgrades that require this increased capacity. This dynamic often forces our devices to break early or become unfashionable long before they might otherwise be decommissioned.

Today, the US Environmental Protection Agency (EPA) estimates that two-thirds of all discarded consumer electronics still work. "We are now on a global trajectory to toss out over a billion computers annually. This is not just because we have more of these devices but because we use them so briefly. The average lifecycle of a smartphone is about 21 months. Likewise, laptops, tablets and many of our high-tech gadgets have life spans of less than three years,[3]" points out David S. Abraham in his book The Elements of Power (2015).

"Longest burning Light Bulb in history" in its 115th year and more than 1,000,000 hours of illumination. Ironically, during few years of livestreaming, 3 different webcams were replaced. http://www.centennialbulb.org

2 named after Gordon Moore, the co-founder of Fairchild Semiconductor and Intel

3 The Elements of Power: Gadgets, Guns and the Struggle for a Sustainable Future in the Rare Metal Age by David S. Abraham.

Government-Endorsed Afterlife

Cuba, a country preserved by isolation and run by the same regime for almost six decades, is conducting a long social experiment against planned obsolescence. Since the 1960s, the Committees of Spare Parts (Comités de Piezas de Repuesto) advocated that workers should not just own their own tools of production, but they should also be able to fix and even create new ones. "Worker, build your own machinery!" declared Ernesto "Che" Guevara.

Sixty years later, many objects in Cuba are pushing the boundaries of their original lifespan. The repairing spirit is part of everyday life on the island. Similar to extended afterlife of things from the Alang scrapyard, in Cuba we find many tools, appliances, and parts living on in new, reinvented ways.

In the 1990s, while the rest of the world furiously consumed short-term trends, the Cuban government institutionalized the act of repairing. With publications like El libro de la familia (1991), the government open sourced the appliances imported from the Eastern Block. They provided repair guides and DIY tips—with the goal of delaying the disposal of scarce items.
Cuban designer and artist Ernesto Oroza curated a collection of these hacks. He called these innovations technological disobedience. He notes, "It is as if when you have enough broken fans you start to see them as a collection of usable structures, joints, motors and cables laid bare. This liberation makes us rethink our understanding of raw materials." [4]

http://yusnaby.com/10-cosas-que-para-bien-o-para-mal-los-cubanos-no-podremos-olvidar/

4 http://www.technologicaldisobedience.com/es/category/notes/

Right to cure devices

Design, whether seen through a socialist or capitalist lens, is always in dialogue with economics and material reality. Even the smallest screw can represent the ideology of its manufacturer.

Apple deploys a specially designed pentalobe screw in its products since 2009. It is an unequivocal barrier against the owners of the devices; they cannot open, examine or ultimately fix their things.

For Apple and many other technology companies, the idea of ownership is clearly deviates from the one depicted by makers, "If you can't open it, you don't own it."

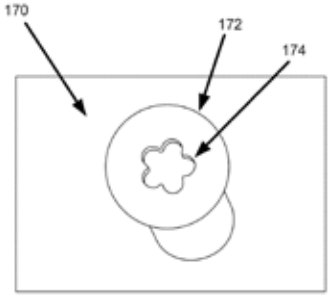


Fig. 11a

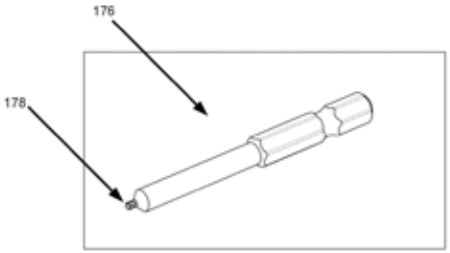
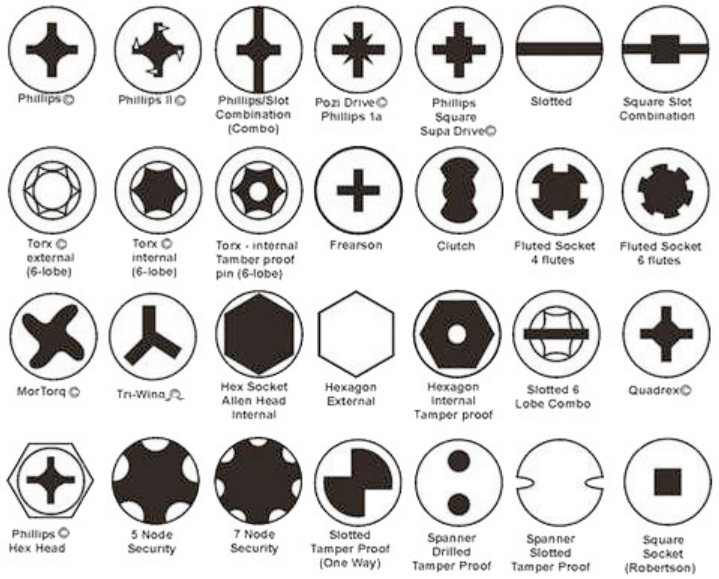


Fig. 11b

Increasingly, we don't even buy our devices. Instead, we lease them, such as with two year phone contracts or IoT devices maintained by monthly payments. Companies introduced restrictive licensing agreements that bar users from fixing hardware or software themselves[5]. In these situations, the real owner is the company. They do their best to ensure that customers can't do anything else other than consume.

The principle of "access over ownership" is often heralded as a paradigm of efficient consumption and good for society. However, it is potentially achieving the opposite. Society is increasingly wrapped in leases, debt and precarious working and living conditions. Gig-based work performance affects the quality of services we can access.

5 https://motherboard.vice.com/en_us/article/why-american-farmers-are-hacking-their-tractors-with-ukrainian-firmware



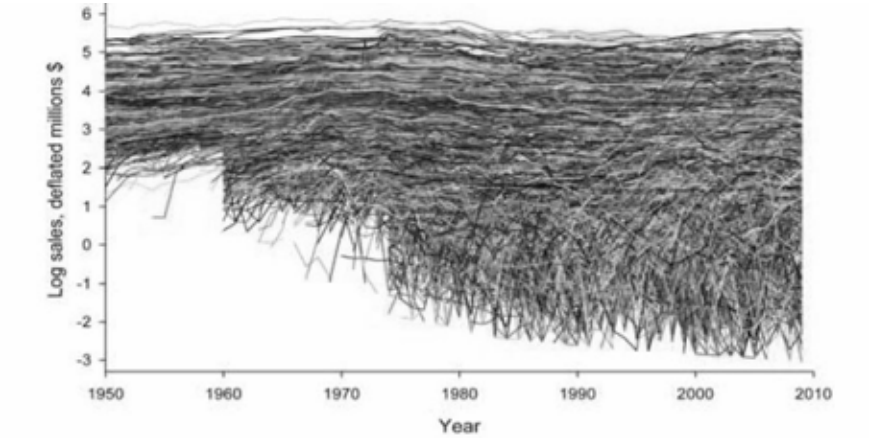
Digital Dark Age

To conclude, I would like to draw the line from the death of objects and planned obsolescence to a possible future called the digital dark age.

Much of our data today is hosted by some Fortune 500 companies. And these companies have their own lifecycles. Using a statistical technique called survival analysis, a group of researchers discovered a company's mortality rate. A company's risk of dying has nothing to do with how long it had already been in business or what kinds of products it produced. Regardless of what industry the company is in, the team estimated that the typical company lasts about ten years before it's bought out, merges, or gets liquidated.

One should not be under the illusion that information available today will still be available in ten years.

This is why open software, hardware and data is needed. And we also need digital libraries and archives such as Internet Archive to structure and store new knowledge. Similarly, as the internet moves into more physical forms, we must preserve and extend the lives of material things. Else it will all too quickly end up in a landfill graveyard.



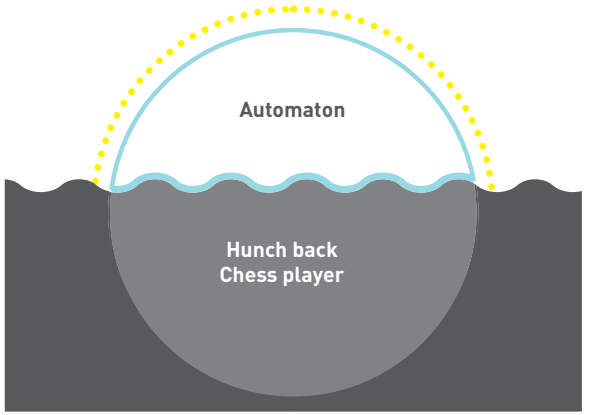
Line of Sight

Romit Raj

> *The story is told of an automaton constructed in such a way that it could play a winning game of chess, answering each move of an opponent with a countermove. A puppet in Turkish attire and with a hookah in its mouth sat before a chessboard placed on a large table. A system of mirrors created the illusion that this table was transparent from all sides. Actually, a little hunchback who was an expert chess player sat inside and guided the puppet's hand by means of strings.*
>
> *Walter Benjamin, Thesis on the Philosophy of History*

It may be imagined that any sublime piece of technology hides under it, like the tip of an iceberg, a set of mechanisms that makes the technology possible. What is visible is often widely acceptable as a responsible product or service to most consumers. What modern technology is able to achieve, above the surface, is not merely magically convenient. It extends to also include such qualities as fairness, empowerment, safety, freedom, sustainability, community among others. With these attributes technology is purported to be a key cog in the solution wheel (to most of the world's problems). However the core mechanisms of modern technology, hidden from most people, often are in conflict with the qualities mentioned above.

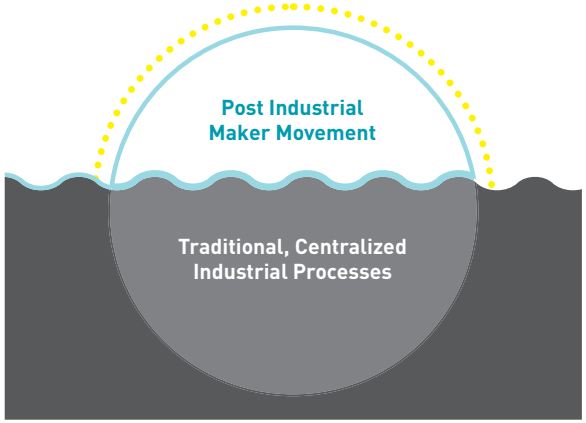
Here is an abstracted drawing of the mechanical turk mentioned above, which will serve as a framework to look at how a lack of transparency into its core processes may be a deliberate feature of modern technology.



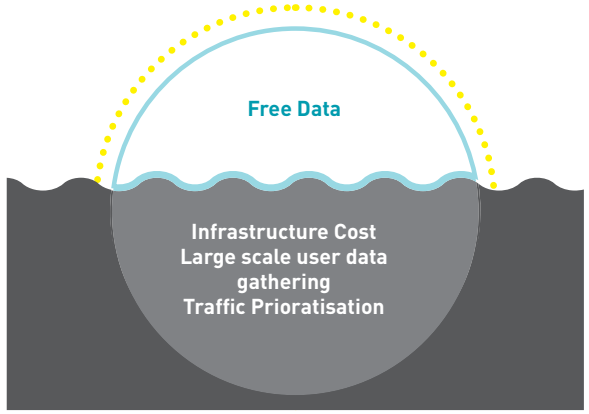
The hidden layer underneath is what makes the contraption possible but revealing it also robs it of its intrigue and sophistication. Another way to look at it is to see the human hand under what is apparently a non-human experience. A human hand carries with it a critical piece of baggage that an impartial technological entity may not - politics. When the human hand is hidden from technology, it appears apolitical and impartial; often though, this is an illusion just as in the case with the mechanical turk.

Below we will look at some examples where technologies that are showcased as disruptive and disconnected pieces are in-fact underpinned by traditional and centralized processes, which if they were to be made visible would cast the technology in a completely different light to users.

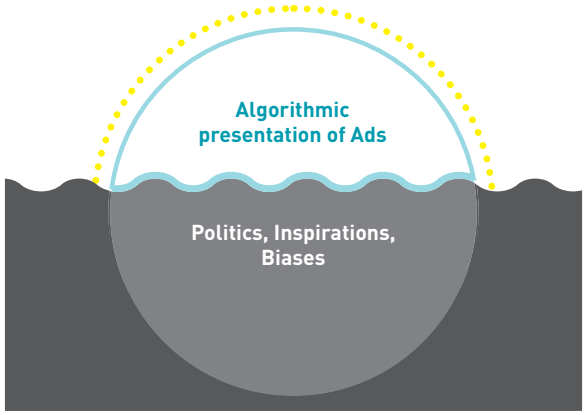
1. Post Industrial Maker Movement - 3D printers and associated technologies had promised to change manufacturing- decentralising and democratising an essential process of the modern economy. However, this never materialised and many would argue that the 3D printer hype is now well into decline. Looked at carefully, this is hardly surprising. 3D Printers were after all completely enmeshed in the industrial process they were meant to disrupt. While there were claims of 3D printers printing themselves, components of most printers including the frame, microchips, the plastic etc were largely products of the mainstream industrial processes.



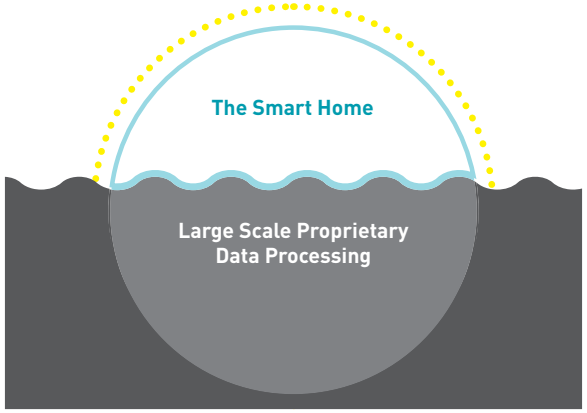
2. Free Data - Free data is seen by many as a potential human right. Free data however does not exist. It usually involves accounting creativity where the infrastructure cost of providing free data is not articulated for the general public. Free data, usually, also involves other costs to be borne by the users such as large scale data gathering and compromises to net neutrality. Facebook's free data plan, which was rejected by India is a great example of this. Facebook was willing to provide a large number of poor Indians with free data if they were allowed to control what that data was being used for (for Facebook and Facebook related services of course).



3. Impartial Algorithms and Artificial Intelligence - It is often argued that algorithms are impartial and therefore their results should be seen as impartial technical truths. However, algorithms too have politics implicit within them through their interaction with humans. Apart from the the fact that writing algorithms is in itself a political act, AI algorithms often capture large amounts of data to build intelligence around a problem they are meant to solve. Since this data is often generated through human action, algorithms are inevitably tainted with human politics.



4. IoT and the smart home - One of the most advertised qualities of the Internet of Things is domestic convenience. In the popular imagination the smart home is meant to liberate the modern home owner from everyday chores while their smart home manages itself. What is not advertised is the large scale data collection and centralized proprietary processing of this data that happens in the background.



The examples above are meant to show the hidden dimension of the modern technology paradigm. From apparently disruptive and revolutionary innovations to technologies aimed at convenience for the middle classes, most technological interfaces that are sold to users are done so with a very narrow focus and keeping the large body of the internal machinery out of view. In many cases this focus on the interface hides qualities of the technological system that the user should know about, to make an educated choice about the system. Algorithms that appear impartial may in-fact have highly political undertones, interfaces that appear eco-friendly may in-fact be overlaid on components that severely harm the environment. More transparency is therefore called for when technological systems are advertised to users.

During our week in Goa, the Caravan team brainstormed around a hypothetical index of sorts that would transparently indicate the true cost of IoT objects. The idea emerged from a desire to tell the story of IoT objects in a truthful manner. These stories were meant to include details such as where the components of the objects come from, the values of the organisations that design and manufacture these objects, what happens to the data that these objects collect etc. Our fictitious index was imagined as an indicator, that all IoT objects will require to carry, to transparently convey to potential users the true nature of these objects.

	STORYTELLING BASED HEALTH INDEX OF IoT DEVICES			FIT BIT	62	132	0.4696969697	IoT Gandhi Loom	126	132	0.9545454545	IoT BARBIE	65	132	0.4924 242424
Sustainability					8	18			16	18			9	18	
Production chain transparency			s1	1	2	3		1	2	3		1	2	3	
Conflict Minerals			s2	1	2	3		1	2	3		1	2	3	
Worker rights			s3	1	2	3		1	2	3		1	2	3	
Life expectancy of object			s4	1	2	3		1	2	3		1	2	3	
Locality index			s5	1	2	3		1	2	3		1	2	3	
Energy consumption			s6	1	2	3		1	2	3		1	2	3	
Privacy					23	42			42	42			21	42	
Availability of Privacy Policies	Are the company's privacy policies freely available and easy to understand?		p1	1	2	3		1	2	3		1	2	3	
Privacy Policies, notice and record of changes	Does the company commit to provide meaningful notice and documentation to users when it changes its privacy policies?		p2	1	2	3		1	2	3		1	2	3	
Collection of user information	Does the company disclose what user information it collects, how it collects this information, and why?		p3	1	2	3		1	2	3		1	2	3	
Sharing of user information	Does the company disclose if and how it shares user information with third parties?		p4	1	2	3		1	2	3		1	2	3	
User control over information collection and sharing	Does the company provide users with options to control the company's collection and sharing of their information?		p5	1	2	3		1	2	3		1	2	3	
Users' access to their own information	Are users able to view, download or otherwise obtain, in structured data formats, information about them that the company holds?		p6	1	2	3		1	2	3		1	2	3	
Retention of user information	Does the company disclose how long it retains user information?		p7	1	2	3		1	2	3		1	2	3	
Collection of user information from third parties	Does the company publish clear information about whether it collects user information from third parties?		p8	1	2	3		1	2	3		1	2	3	
Process for responding to third-party requests for user information	Does the company publish information about its process for evaluating and responding to requests from government and other third parties for stored user data and/or real-time communications, including the legal basis for complying with such requests?		p9	1	2	3		1	2	3		1	2	3	
User notification about third-party requests for user information	Does the company commit to notify users to the extent legally possible when their data has been requested by governments and other third parties?		p10	1	2	3		1	2	3		1	2	3	
Data about third-party requests for user information	Does the company regularly publish data about government and other third-party requests for user information, plus data about the extent to which the company complies with such requests?		p11	1	2	3		1	2	3		1	2	3	
Security standards	Does the company deploy industry standards of encryption and security for its products and services?		p12	1	2	3		1	2	3		1	2	3	
Encryption of users' private content	Can users encrypt their own content and thereby control who has access to it?		p13	1	2	3		1	2	3		1	2	3	
Inform and educate users about potential threats	Does the company publish information to help users defend against cyber threats?		p14	1	2	3		1	2	3		1	2	3	
Openess					4	12			12	12			4	12	
Open design			o1	1	2	3		1	2	3		1	2	3	
Open code			o2	1	2	3		1	2	3		1	2	3	

Algorithmic transparency			o3	1	2	3		1	2	3		1	2	3		
Compatibility Index			o4	1	2	3		1	2	3		1	2	3		
Decentralisation index					2	6			5	6			2	4		
Localised processing of data vs central processing			d1	1	2	3		1	2	3		1	2	3		
Individual and community record-keeping			d2	1	2	3		1	2	3		1	2	3		
Ownership					9	18			18	18			10	18		
Right to modify			o1	1	2	3		1	2	3		1	2	3		
Right to repair			o2	1	2	3		1	2	3		1	2	3		
Right to open			o3	1	2	3		1	2	3		1	2	3		
Right to turn it off			o4	1	2	3		1	2	3		1	2	3		
Right to copy			o5	1	2	3		1	2	3		1	2	3		
Right to own data and content			o6	1	2	3		1	2	3		1	2	3		
Freedom of Expression					12	24			21	21			15	24		
Reasons for content restriction	Does the company disclose whether it prohibits certain types of content or activities?		f3	1	2	3		1	2	3		1	2	3		
Reasons for account or service restriction	Does the company explain the circumstances under which it may restrict or deny users from accessing the service?		f4	1	2	3		1	2	3		1	2	3		
Notify users of restriction	If the company restricts content or access, does it disclose how it notifies users?		f5	1	2	3		1	2	3		1	2	3		
Data about government requests	Does the company regularly publish data about government requests (including judicial orders) to remove, filter, or restrict content or access to service, plus data about the extent to which the company complies with such requests?		f7	1	2	3		1	2	3		1	2	3		
Data about private requests	Does the company regularly publish data about requests from non-governmental (and non-judicial) parties to remove, filter, or restrict access to content, plus data about the extent to which the company complies with such requests?		f8	1	2	3		1	2	3		1	2	3		
Network management	Does the company disclose whether it prioritizes or degrades transmission or delivery of different types of content (e.g, traffic shaping or throttling) and if so, for what purpose?		f0	1	2	3		1	2	3		1	2	3		
Identity policy	Does the company require users to verify their identity with government-issued identification, or with other forms of identification connected to their offline identity?		f11	1	2	3		1	2	3		1	2	3		
User Interface as agency			f12	1	2	3		1	2	3		1	2	3		
Other ...					4	12			12	12			4	12		
AI and robot rights	Robot rights are the moral obligations of society towards its machines, similar to human rights or animal rights		ot1	1	2	3		1	2	3		1	2	3		
Weaponization index	Level of weaponisation of the objects		ot2	1	2	3		1	2	3		1	2	3		
Index of non-violence			ot3	1	2	3		1	2	3		1	2	3		
usefullness index	Does this object really need to exist?		ot4	1	2	3		1	2	3		1	2	3		

END NOTES

This publication aspired to throw some light on opportunities for craft practices, or at the very least a craft ethos, to inform decentralized thinking and acting within the field of IoT: to suggest ways in which it might be useful to reorient discussions away from pure technology led functionality (we did it because we can) and towards a more human centred approach (we did it because it adds value to our lives). I recognise that, like all oppositional juxtapositions, these are not clearly distinct and there are always fuzzy edges. However, I believe that through this publication, craft characteristics have been identified that provide a new perspective on the area of IoT, many of these have been highlighted in the 'Why Craft-mini manifesto'. To highlight just a few: beauty and enchantment, as fundamental aspirations, are not part of everyday debates about the development and impact of new IoT forms and networks, nor is the promoting of a meaningful understanding and control over your tools (in IoT's case this means devices and data), something raised by Praveen in his interview piece and that is being explicitly explored by the Casa Jasmina project. As recognised in the 'Why craft for dentralised IoT', a craft ethos, that often promotes localised and/or personalised responses, is naturally inclined to decentralisation and to drawing on local knowledge and material resources. This is discussed in the 'Localised tools for local contexts' piece and a beautiful ethically robust example of decentralisation in India is provided by the 'Gandhian Dream' piece. These examples all provide, if not evidence, then at least a strong impulse to think about craft as way of engaging that brings distinctive values and ways of working.

This brings me round to reflecting on why the context of India was so useful for this project. For me India is an intriguing country in which aspects of modern globalised economy sit alongside significant levels of less technologically advanced craft production. The role of craft is distinctly different from that in the UK in which the craft sector is smaller and relatively exclusive, and includes a significant degree of hobby activity.
This is not a judgemental distinction and does not preclude understandings and values from the UK craft sector being useful in the Indian context. I felt however, that there is a recognition of a broad and almost philosophical value placed on craft in India that is different to that found in Europe, which was heartening. For me it also provided an expanded field of potential impact (e.g. what might a craft approach to decentralized IoT look like in a rural Indian village, as opposed to an urban European house). In addition, Indian concepts such as Jugaad - to make existing things work, or to create new things with meager resources, raised by Praveen, provide rich metaphors for an on-the-ground DIY craft approach to IoT development that, while related to aspects of the Hacker and Maker movement, has a unique flavour.

The question that is only partially addressed in this publication is, what do we do next? How do we take our high level musings and turn them into activities that have results

that can be reflected on and their value judged? We have begun to describe the broad stages of a multi-disciplinary craft ethos driven method at the end of the 'Berlin Tapes'. However, this now needs testing in multiple contexts and more thought needs to be undertaken in how different communities of practice can contribute their skills and experience on a level playing field.

The rather dystopian trajectory in 'What does the Internet of Things mean' by Jon Rogers suggests that there is looming risk from new pervasive forms of IoT peddled by highly centralized large scale corporations for both individuals and communities across the world. Even if this process proves to be less pernicious than he believes, should we not have the confidence and commitment to try other approaches to conceptualising, making and using IoT systems and to see what the results are- they will undoubtedly be unexpected, and I would hope healthier.

Justin Marshall

I'm late to writing my reflections if such a thing can be said? Perhaps reflections by their nature take time. I've been playing around recently with the notion of what happens when we take vast potential and lock it out of the hands of billions of people and place it in the hands of a very few. This has never ended well. Yet here we are again at a point where rapid and massive advancements in technology is forcing our history to collide with our future. That the internet is forcing a developmental fault line that could cause widespread disruption (that term so beloved of the Silicon Valley few) to political, economic and environmental structures looking like they will not bode well for all of us. It reminds me of a book that I read 20 years ago. A time of very personal development for me. A time when my life became what it is now. A time when I discovered what I was good at - teaching electronics in an arts school, a time when I met my wife, a time when I realised that being successful was irrelevant to me and that I could just do what I loved. I was reading the remarkable transdisciplinary non-fiction book "Guns Germs and Steel" by Jared Diamond (1997). It convincingly documents 13,000 years of history that shows how global societies have been drastically reshaped by the ability of one small group of people to master a particular technology and use this to force change on global populations. It is a cautionary tale. I read it in the year when I first discovered the search engine Google.

I was in the middle of wrestling with my doctoral thesis writing and drowning under the weight of self-doubt when Gillian Crampton Smith threw me a lifeline in the form of this simple statement: "A PhD is not a test of intelligence, it is a test of endurance". This sense that it was about embracing the length of time that a PhD took rather than being the most brilliant enabled me to have the confidence to complete what I started. I knew I could do endurance, I'd learnt that on the factory floor of my father's paving slab business. I didn't have to be brilliant, I just had to take my time and go at my pace. This represents so much of what Gillian stands for, in her lifetime dedicated to the development of the interaction design community. That things are shaped over time. And fast forward now to today. I'm sitting in the house that Davide Gomba helped to establish. It is the open source home of crafted technology - Casa Jasmina. I'm just back from an intense week of bringing our network together in the Rockefeller Bellagio Centre (which I'll save for another publication!). Gillian joined us a a participant. One evening over a campari and soda we were discussing craft and it's relationship to the development of digital technologies. It has after all been the focus of a lifetime of work for her. There is no-one more qualified to ask. I'm paraphrasing here, but the gist of the conversation was along the lines that "Computer Scientists just don't understand craft. I've been trying for 30 years and they still don't understand it". Which is depressing because if Gillian, a dedicated clear and brilliant communicator, can't make herself heard, then how can the rest of us? This I think is reflected in much of what Justin is saying too. That's not to say we give up, it just reflects the enormous complexity of trying to bring new voices to technology. Which if you look at it, has been enormously successful by ignoring craft and ruthlessly forging a powerful industrial design machine. Yet I feel that if we ignore what's happening and don't try to take the slower, more inclusive, resilient approach that craft represents, then yes of course technology will rapidly develop, it is just that we have to consider the people impacted and potentially left behind as technology enables a minority to take dominance.

Diamond, J. M. (2017). Guns, germs, and steel: the fates of human societies. New York: W.W. Norton & Company.

Jon Rogers